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The Genus *Andreaea* (Musci) in Maine

Bruce Allen[1]

Andreaea is a small moss (generally 10-20, rarely to 40 mm high) distributed throughout the state where it occurs on neutral to acidic rocks, boulders and cliff faces. Frequently a pioneer on exposed rocks, it develops a reddish-black coloration in response to strong sunlight. In shaded situations it is greenish-black. It is especially well-developed in areas where water seasonally seeps over bare rock. The genus can be confused with *Grimmia* or *Schistidium*. It is best recognized by the 4 long vertical splits along the sides of its frequently produced capsules; no other Maine moss has this feature. *Andreaea* also lacks a peristome. In *Grimmia* and *Schistidium* the capsules open by means of an apical, horizontal annulus and peristome teeth are usually present. In the absence of capsules, its distinctive reddish coloration and strongly thickened, rounded leaf cells aid in its recognition.

There are three species of *Andreaea* in Maine. Unless otherwise indicated the specimens on which the county distributions are based were cited in the journal *Evansia* (Allen 1987, 1989, 1991, 1992).

Andreaea Hedw., Spec. Musc. 47. 1801.

Plants perennial, in brittle tufts; rhizoids at base of stems and branches. Stems lacking a central strand. Axillary hairs with 1-3 quadrate, brown, basal cells and a cylindrical, hyaline terminal cell. Scale-like leaves present at base of stems, upper leaves usually clasping or sheathing at base; margins plane or incurved; costa single and well-developed or absent; cells incrassate, smooth or sinuose, short throughout or short above and rectangular below, dorsally papillose or smooth. Perichaetial leaves often enlarged and sheathing the pseudopodium. Capsules shortly exserted at the ends of the pseudopodia, spindle-shaped, splitting from near the base to near the apex into 4 vertical valves. Stomata absent. Annulus, operculum and peristome absent. Spores brown, variable in size (13-60μm). Calyptra small and fugacious, campanulate-mitrate, smooth, more or less lacerate at base.

1. Leaves ecostate, ovate, oblong-lanceolate, panduriform at base ..... 1. *A. rupestris*
1. Leaves costate, linear-lanceolate, narrowly ovate at base .... 2.
    2. Midleaf laminae uni- or bistratose, clearly demarcated from the costa; lamina distinct in the lower part of the subula .... 2. *A. rothii*
    2. Midleaf laminae multistratose, difficult to distinguish from the costa; lamina indistinct in the subula .... 3. *A. crassinervia*

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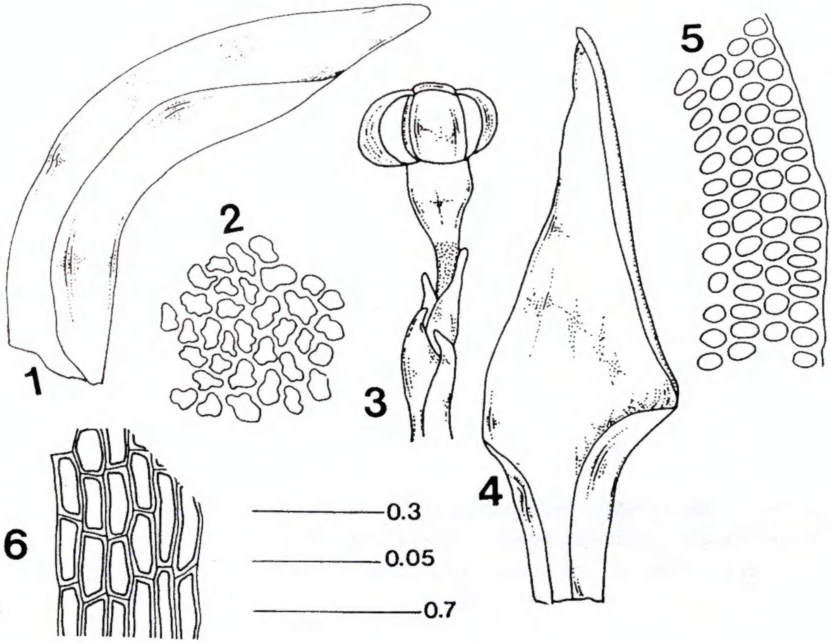
1. *Andreaea rupestris* Hedw.

Plants 5-30 mm high. Leaves 0.5-1.0 mm long, straight or secund, appressed when dry, spreading or squarrose when wet; ovate or oblong-lanceolate, constricted or panduriform at base; apex acuminate, obtuse or acute, concave with erect, entire margins. Costa absent. Lamina unistratose; upper cells quadrate to short rectangular, very incrassate, pitted, collenchymatous (stellate), papillose at back; lower cells elongate, incrassate, at times sinuose. Autoicous; perichaetial leaves nearly reaching the base of the capsule. Capsule 0.5-1.25 mm long. Spores 21-28 μm.

Distribution in Maine: Androscoggin, Aroostook, Cumberland, Franklin, Hancock, Knox, Oxford, Piscataquis, Somerset and Waldo.

The most common species of *Andreaea* in Maine. It has relatively stout stems as a result of its stiffly erect, panduriform (fiddle-shaped) leaves. It is the only Maine *Andreaea* with ecostate leaves, which also distinguishes it from *Grimmia* or *Schistidium*. The ecostate condition can be difficult to demonstrate in the field with a hand-lens, but the species can be field-recognized by its distinctive coloration, restriction to bare acidic rocks and stiffly erect, short and broad leaves. I have seen one Hancock county collection of *A. rupestris* that also contained *A. rothii*.



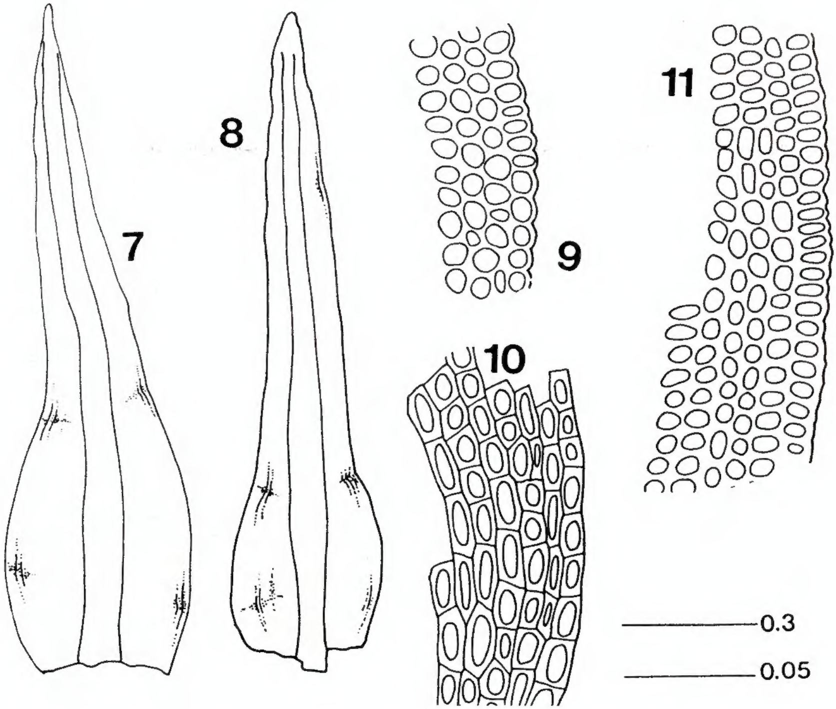
Figs. 1. & 4. Leaves. Fig. 2. Upper leaf cells. Fig. 3. Sporophyte. Fig. 5. Marginal cells at mid-leaf. Fig. 6. Inner basal leaf cells. Leaves: top scale; cells: middle scale; sporophyte: bottom scale.

2. *Andreaea rothii* Web. & Mohr

Plants 0.5-20 mm high. Leaves erect to falcate-secund wet or dry, 1-2 mm long, linear-lanceolate, narrowly acuminate from a narrow, ovate base. Costa single, strong, percurrent to shortly excurrent, bulging on the dorsal surface, filling the uppermost leaf but clearly demarcated at base and mid-leaf. Cells incrassate throughout, occasionally sinuose at base, upper cells short, round to oblate, basal cells rectangular, quadrate toward the margins. Lamina uni- or bistratose above, unistratose at base. Autoicous. Capsules 1 mm long. Spores 36-52 μm.

Distribution in Maine: (Franklin: Parlin, 1939), Hancock and Knox.

Differs from *A. rupestris* by its linear-lanceolate, costate, erect or falcate-secund leaves. It is indistinguishable from *A. crassinervia* in the field. *Andreaea crassinervia* has multistratose leaves at and above midleaf and therefore the costa is weakly demarcated from the lamina in that region. The apical leaf regions in both species are similar. Presently, the two species are geographically distinct in Maine: *A. rothii* has been verified from two coastal counties, while *A. crassinervia* is restricted to the inland mountains of Oxford county.



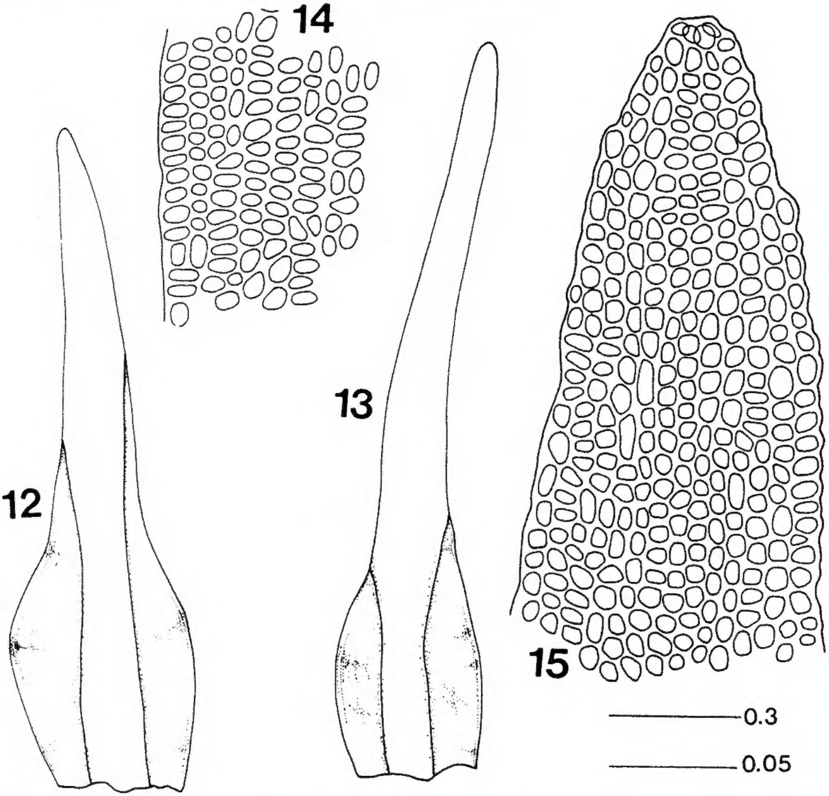
Figs. 7. & 8. Leaves. Fig. 9. Upper leaf cells. Fig. 10. Inner basal leaf cells. Fig. 11. Marginal cells at mid-leaf. Leaves: top scale; cells: bottom scale.

3. *Andreaea crassinervia* Bruch

Differs from *A. rothii* only in having leaves that are always falcate, a multistratose leaf lamina at mid-leaf and smaller spores (25-30 µm). Because of its multistratose lamina the leaf is terete in cross-section at midleaf and the costa can hardly be distinguished from the lamina.

Distribution in Maine: Oxford.

Considered the same as *A. rothii* by Crum and Anderson (1981) and Ireland (1982), it is recognized at the species level by Schultz-Motel (1970) and Murray (1987, 1988). Murray distinguished *A. crassinervia* from *A. rothii* by three features: laminae indistinct in upper leaf, costa not dorsally bulging, and spores smaller. The first two distinctions are aspects of the same feature, i.e. a multistratose upper lamina that is therefore terete in cross-section. The leaves of *A. rothii* can be bistratose above and so difficult to distinguish from *A. crassinervia*. *Andreaea crassinervia* is presently known in Maine from three localities in Oxford county.



Figs. 12. & 13. Leaves. Fig. 14. Marginal cells at mid-leaf. Fig. 15. Leaf apex. Leaves: top scale; cells: bottom scale.

Literature Cited.

Allen, B. H. 1987. Mosses from the state of Maine - II. Evansia 4: 42-45.
_____. 1989. Mosses from the state of Maine - IV. Evansia 6: 17-21.
_____. 1991. Mosses from the state of Maine - V. Evansia 8: 1-8.
_____. 1992. Mosses from the state of Maine - VI. Evansia 9: in press.
Crum, H. A. & L. E. Anderson. 1981. Mosses of Eastern North America. Vol. 1. Columbia University Press, New York.
Ireland, R. R. 1982. Moss Flora of the Maritime Provinces. National Museums of Canada Publications in Botany 13: 1-738.
Murray, B. M. 1987. Illustrated Moss Flora of Arctic North America and Greenland. 3. Andreaeobryaceae-Tetraphidaceae. Medd. Grønland, Bioscience 23: 1-36.
_____. 1988. The genus *Andreaea* in Britain and Ireland. J. Bryol. 15: 17-82.
Parlin, J. C. 1939. Some Maine Lichens, Hepatics and Mosses. Bull. Josselyn Bot. Soc., Maine 7: 30-59.
Schultz-Motel, W. 1970. Monographie der Laubmoosgattung *Andreaea* 1. Die costaten Arten. Willdenowia 6(1): 25-110.

The Second Find of *Fissidens hyalinus* in Louisiana

William D. Reese[1]

Fissidens hyalinus Wils. & Hook. was first reported from Louisiana by Lemmon in 1966 as a major southward extension of its range in the United States. This rare tiny moss is known otherwise in the United States from Kentucky (cf. Snider et al. 1988), Ohio (from which *F. hyalinus* was first described), and Pennsylvania (Crum & Anderson 1981). The species also occurs in Cuba (R. A. Pursell, pers. comm.), Mexico and Venezuela (Pursell 1986), and Peru (Pursell & Hegewald 1979), and in Japan, Taiwan, and western Himalaya (Noguchi 1987). I here report a second locality in Louisiana for *F. hyalinus*.

Louisiana. West Feliciana Parish. Along bottom of deep ravine in *Fagus-Magnolia* forest, due E of Angola State Prison, 1.7 mi. E along unnamed dirt road from its end on La. Rte. 66; in drainage of Sands Creek; on clay-loess walls of ravine bottom; 17 Oct 1991, Reese 18036 (LAF, PAC); as above, 12 Nov 1991, Reese 18041 (LAF). Both c.fr.

The minute plants of *F. hyalinus* were widely scattered in moderate abundance among remote stems of much larger plants of *F. bryoides* Hedw. ("*bryoides*" expression). In

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the October collection, many of the plants of *F. hyalinus* were fertile but the sporophytes were all green and submature. In the November collection the sporophytes were mature and most had shed their opercula and spores. The plants with mature sporophytes were somewhat noticable in situ because of their bright reddish-orange peristomes, but still very difficult to find. The gametophores, setae, and capsules of the mature plants in the November collection mostly appeared bleached and yellowish, in contrast to the rich dark green color of the plants in the October collection.

The plants that Lemmon reported (1966) were also fertile; her collection was made in October. The locality of the new find is approximately 4 miles southeast of the site of Lemmon's collection, in the same type of loess ravine terrain in *Fagus-Magnolia* forest.

Fissidens hyalinus appears to be an ephemeral moss. The soft delicate plants occupy a rather temporary habitat in Louisiana--bare soil at the bottoms of ravines where rainfall rushing down the ravines washes away the soft erosion-prone soil, creating new but short-lived habitat. Noguchi (1987) also noted "newly eroded soil" as a habitat for this moss, which he stated also occurs on rocks covered with thin soil.

In the vicinity of the Louisiana populations of *F. hyalinus*, September and October are the driest months of the year, according to precipitation records from Angola (Dyke 1941). It may be that the local populations of *F. hyalinus* are tuned to the annual low in precipitation for growth and spore production in their ephemeral ravine bottom habitat, i.e., the time of year during which the habitat is least susceptible to erosion.

Acknowledgments. I thank R. R. Ireland and R. A. Pursell for comments on the manuscript.

Literature Cited

Crum, H. & L. E. Anderson. 1981. *Mosses of Eastern North America*, Vol. 1. New York.Dyke, R. A. 1941. Climate of Louisiana, pp. 894-903. *In* G. Hambidge (ed.), *Climate and Man, 1941 Yearbook of Agriculture*. United States Department of Agriculture, Washington, D.C.

Lemmon, B. E. 1966. *Fissidens hyalinus* in Louisiana. *The Bryologist* 69: 241-243.

Noguchi, A. 1987. *Illustrated Moss Flora of Japan, Part 1*. Supplemented by Z. Iwatsuki. Nichinan.

Pursell, R. A. 1986. Additions and deletions to the genus *Fissidens* (Fissidentaceae) in Mexico, including four new species. *Cryptogamie, Bryologie-Lichénologie* 7: 37-46.

________ & E. Hegewald. 1979. On *Fissidens* in Peru. *The Bryologist* 82: 267-270.

Snider, J., S. M. Studlar & M. Medley. 1988. A list of the bryophytes of Kentucky. *The Bryologist* 91: 98-105.

Should mosses have common names?
Part 6. The Common Names of Buxbaumiales and Grimmiales

Janice M. Glime[1]

Two of the most unusual mosses are *Buxbaumia* and *Diphyscium*. These mosses have capsules that are tilted and more or less flattened on the upper side. The opening is very small, and I question whether it functions at all in *Buxbaumia*, as the capsules in our area usually split across the flat surface and lose their spores that way before the operculum is shed. It is the strange capsules that earn these mosses their collection of common names, including such names for *Buxbaumia* as hump-backed elves, bug on a stick, and Aladdin's lamp (although I can't find a reference for the latter one).

The genus *Grimmia* has a Japanese name (giboshi) meaning the sphere on the top of a bridge post, but most of the western names are merely descriptions of "grimmia."

Conventions in formatting follow Glime (1989). The **meaning** of the scientific name, as supplied by Elizabeth Dunham, is provided immediately after the scientific name. Any structure to which the name applies is in parentheses. Nomenclature follows Anderson, *et al.* (1990).

Buxbaumiales

Buxbaumiaceae

Buxbaumia Hedw.: for Buxbaum of Germany[9]; bugs on a stick[1]; hump-backed elves[2]; Japanese pipe[13]; smoking pipe moss[14]; shield moss[25]

Buxbaumia aphylla Hedw.: humpbacked elves[1]; bug on a stick[2]; elf-cap moss[3]; bug-on-a-stick moss[6]; leafless buxbaumia[8, 20]; hump-backed elves, bug on a stick[10]; fairy spoons, leafless buxbaumia[11]; common smoking pipe moss[14]; bug on a stick moss[21]; brown shield moss[25]

Buxbaumia minakatae Okam.: kumano clove[13]

Buxbaumia viridis (DC.) Moug. & Nestl.: green shield moss[25]

Diphyscium Mohr: diphyscium[8]; boar neck moss[13]; short-neck moss[14]

Diphyscium foliosum (Hedw.) Mohr: powder gun moss[2, 10]; nut moss[3, 25]; leafy-diphyscium[4]; grain-of-wheat moss[6]; leafy diphyscium[8]; leafy buxbaumia[11]; mountain boar neck moss[13]; common short-neck moss[14]

Grimmiales

Grimmiaceae

Coscinodon Spreng.: sieve-teeth moss[14]

Coscinodon cribrosus (Hedw.) Spruce: sieve-toothed moss[11]; old-man moss[25]

Dryptodon patens (Hedw.) Brid.: spreading fringe moss[8]; spreading-leaved grimmia[11]; wing moss[25]

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Grimmia Hedw.: for Grimm of Germany[9]; beard mosses[2]; giboshi moss (sphere on bridge post)[13]; purple moss[14]; grimmia[25]

Grimmia affinis Hoppe & Hornsch. ex Hornsch.: north grimmia[25]

Grimmia anodon Bruch & Schimp. in B.S.G.: toothless grimmia[11]; spoon grimmia[25]

Grimmia anomala Hampe ex Schimp.: mountain forest grimmia[25]

Grimmia atrata Miel. ex Hornsch.: black-tufted grimmia[8]; tufted black grimmia[11]; copper grimmia[25]

Grimmia donniana Sm.: Donian grimmia[8]; apple-fruited grimmia[11]; rolled-leaf purple moss[14]; mountain grimmia[25]

Grimmia elatior Bruch ex Bals. & De Not.: large grimmia[25]

Grimmia elongata Kaulf. in Sturm: long-stalked grimmia[11]; brown grimmia[25]

Grimmia funalis (Schwaegr.) Bruch & Schimp. in B.S.G.: spiral-leaved grimmia[11]; screw grimmia[25]

Grimmia hartmanii Schimp.: Hartman's grimmia[11]; forest grimmia[25]

Grimmia incurva Schwaegr.: black grimmia[25]

Grimmia laevigata (Brid.) Brid.: silver beard moss[16]; wool grimmia[25]

Grimmia mollis Bruch & Schimp. in B.S.G.: water grimmia[25]

Grimmia montana Bruch & Schimp. in B.S.G.: sun grimmia[25]

Grimmia orbicularis Bruch ex Wils.: round-fruited grimmia[11]

Grimmia ovalis (Hedw.) Lindb.: flat rock grimmia[25]

Grimmia pilifera P. Beauv.: hair giboshi moss[13]

Grimmia plagiopodia Hedw.: common purple moss[14]; bird grimmia[25]

Grimmia pulvinata (Hedw.) Sm.: grey cushion moss[7]; grey-cushioned grimmia[8, 11, 20]; hair grimmia[25]

Grimmia tenerrima Ren. & Card.: alpine grimmia[5]

Grimmia torquata Hornsch. in Grev.: twisted-leaved grimmia[11]; spinning grimmia[25]

Grimmia trichophylla Grev.: hair-pointed grimmia[8, 11]; clipped grimmia[25]

Grimmia unicolor Hook. in Grev.: dingy grimmia[8, 11]; blunt grimmia[25]

Schistidium Brid.: split-teeth moss[14]; bloom moss[25]

Schistidium agassizii Sull. & Lesq. in Sull.: elf bloom moss[25]

Schistidium apocarpum (Hedw.) Bruch & Schimp. in B.S.G.: common beard moss[2, 16]; common grimmia[6]; sessile grimmia[8, 20]; sessile-fruited grimmia[11]; giboshi moss[13]; round-fruit split-teeth moss[14]; radiate bloom moss[25]

Schistidium maritimum (Turn.) Bruch & Schimp. in B.S.G.: ocean grimmia[5]; sea-side grimmia[8, 11]; rivulet-bank split-teeth moss[14]; seaside sessile grimmia[20]; salt bloom moss[25]

Schistidium rivulare (Brid.) Podp.: common grimmia[5]; brook bloom moss[25]

Schistidium tenerum (Zett.) Nyh.: thread bloom moss[25]

Schistidium trichodon (Brid.) Poelt: black bloom moss[25]

Ptychomitriaceae

Campylostylium saxicola (Web. & Mohr) Bruch & Schimp. in B.S.G.: sandstone grimmia[8]; bent moss[11]

Ptychomitrium Fürnr.: grizzled moss[13]; shrunken leaf moss[14]

Scouleriaceae

Scouleria Hook. in Drumm.: Scouler's mosses[5]; water-rock moss[14]

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[1] Grout, A. J. 1900. Mosses with a hand-lens. Press of Binghampton Republican, New York, 74 Pp.; ____ 1903. Mosses with a handlens and microscope. By Author. NY

[2] Bland, J. 1971. Forests of Lilliput. Prentice-Hall, Inc., Englewood Cliffs. 210 Pp.

[3] Shuttleworth, F. S. & H. S. Zim. 1967. Non-flowering plants. Ferns, mosses, lichens, mushrooms and other fungi. A Golden Nature Guide, Golden Press, NY 160 Pp.

[4] Marshall, N. L. 1907. Mosses and lichens. Doubleday, Page, & Co., NY 327 Pp.

[5] Harthill, M. P. & I. O'Connor. 1975. Common mosses of the Pacific coast. Naturegraph.

[6] Welch, W. H. 1957. Mosses of Indiana. An illustrated manual. Bookwalter Co., Indianapolis. 478 Pp.

[7] Jewell, A. L. 1955. The observer's book of mosses and liverworts. F. Warne & Co., NY

[8] Stark, R. M. 1860. A popular history of British mosses, 2nd edition. Routledge, Warne, & Routledge, London (Wheldon & Wesley), 348 Pp.

[9] Dunham, E. M. 1951. How to know the mosses. The Mosher Press, Boston.

[10] Crum, H. 1976. Mosses of the Great Lakes forest, revised edition. Univ. Mich. 10: 1-404.

[11] Tripp, F. E. 1888. British mosses, their homes, aspects, structure and uses. George Bell & Sons, Covent Garden, London (Wheldon & Wesley), 2 Vol.

[13] Dr. Zen Iwatsuki (personal communication)

[14] Jinkun Zhang (personal communication, translated from Wu et al. 1984)

[16] Thomas, L. P. & J. R. Jackson. 1985. Walk softly upon the earth. A pictorial guide to Missouri mosses, liverworts and lichens. Missouri Dept. of Conservation, Jefferson City, 129 pp.

[20] Russell, T. H. 1910. Mosses and liverworts. An introduction to their study, with hints as to their collection and preservation. Sampson Low, Marston & Co., 211 Pp., 10 plates.

[21] Vitt, D. H., J. E. Marsh, & R. B. Bovey. 1988. Mosses, lichens & ferns of northwest North America. Lone Pine Publishing, Edmonton, Alberta, Can. 296 Pp.

[25] Hallinbäck, T. & L. Söderström. 1987. Sveriges mossor och deras svenska namm -- en kommenterad checklista. [The bryophytes of Sweden, an annotated checklist with common names.] Svensk Bot. Tidskr. 81: 357-388.

Acknowledgments. The checklist of Swedish mosses and two dictionaries loaned to me by Nancy Slack made the addition of Swedish names possible. Any errors or misinterpretations in translation are mine.

Literature Cited

Anderson, L. E., Crum, H. A. and Buck, W. R. 1990. List of the mosses of North America North of Mexico. Bryologist 93: 448-499.

Glime, J. M. 1989. Should mosses have common names? Evansia 6(1):1-6.

Dicranum acutifolium and *Grimmia hartmanii* var. *hartmanii* in New Hampshire

Bruce Allen[1]

The Missouri Botanical Garden bryophyte herbarium contains a historical collection of mosses made by Thomas Potts James in the White Mountains of New Hampshire. The following two interesting mosses were found in that collection.

***Dicranum acutifolium* (Lindb. & Arnell) C. Jens. *ex* Weinm.** Coos County, Mount Washington, July 1852, *James*.

This collection (named *Dicranum fuscescens* f. *robustum*) has leaves indistinctly undulate, keeled above, and sparsely bistratose on the margins, irregularly shaped upper leaf cells, and a weakly roughened subula. This is the first eastern United States station for *D. acutifolium*, an arctic-alpine species. The nearest locality for this species is in Quebec near the Gaspé Peninsula. (Bellolio-Trucco & Ireland 1990).

***Grimmia hartmanii* Schimp var. *hartmanii*.** Coos County, Glen Ellis, White Mountains, August 1862, *James*.

This collection (named *Schistium apocarpum* var. *alpicolum*), has reddish-brown, globose, multicelluar gemmae clustered at the leaf tips. *Grimmia anomala* Hampe *ex* Schimp. (sometimes treated as *G. hartmanii* var. *anomala*) also has gemmae of this type. The New Hampshire collection has muticous leaves. But it lacks a stem central strand, has narrow, lanceolate, gradually acuminate leaves and smooth, sinuose leaf cells - all typical for *G. hartmanii* var. *hartmanii*.

New Hampshire is only the third regional locality for this taxon in North America. Jones (1933) first reported it from Los Angeles County, California where the species is now considered "occasional" (Harthill, Long & Mishler 1979). The species is also known from the Peaks of Otter, Virginia (Lawton 1959) - detached eastern peaks in the northern section of the Blue Ridge Mountains.

Literature Cited

Harthill, M. P., D. M. Long & B. D. Mishler. 1979. Preliminary list of southern California mosses. Bryologist 82: 260-267.

Jones, G. N. 1933. Grimmiaceae in Moss Flora of North America 3(1): 1-65.

Lawton, E. 1959. Fruiting *Grimmia hartmanii* var. *anomala* in America. Bull. Torrey Bot. Cl. 86: 166-171.

Bellolio-Trucco, G. & R. R. Ireland. 1990. A taxonomic study of moss genus *Dicranum* (Dicranaceae) in Ontario and Quebec. Canad. J. Bot. 68: 867-909.

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The Mosses of New Jersey[1]

Eric F. Karlin[2] & Kimberly A. Schaffroth[3]

Abstract. A total of 366 species and 12 varieties (occurring in addition to typical varieties) have been collected in New Jersey. This includes 30 taxa not previously reported for the state. Northern New Jersey has a much higher species richness (354 taxa) than southern New Jersey (204 taxa). Mosses have generally been undercollected in the state (about 65% of the taxa are known from ≤ 10 sites each) and a large percentage of the taxa are currently known only from historical collections (about 40% were last collected prior to 1950).

Toward the end of the nineteenth century, a Catalogue of Plants Found in New Jersey (Britton 1881, 1889) was prepared for inclusion in the geologic survey for the state. This report included both vascular plants and bryophytes known to have been collected in New Jersey. The bryophyte list was based primarily upon the extensive collections of Coe F. Austin (1831-1880), and was compiled by C.F. Parker, E.A. Rau and E.G. Britton. A total of 291 species and 58 varieties (in addition to the typical varieties) of mosses were listed (281 species and 29 varieties following the nomenclature of Anderson *et al*. (1990)).

Aside from *Sphagnum* (Karlin & Andrus 1988), no taxonomic overview of the mosses of New Jersey has been made since that of Britton (1889). With the significant increase in our knowledge of mosses in New Jersey and the extensive taxonomic changes that have occurred since the late 1800's, an updated treatment appears appropriate.

Overview of bryology in New Jersey. Bryology began in New Jersey with the work of Coe F. Austin (1831-1880). Although his collecting was concentrated primarily in the Pine Barrens, the Palisades/Closter area and the Delaware Water Gap, Austin also made collections from several other locations in the state. A large percentage of his Musci Appalachiani (Austin 1870) specimens were collected in New Jersey and he also prepared a bound collection of New Jersey mosses (Musci Novae-Caesarenses) in 1876 for the Centennial Exposition at Philadelphia (Britton 1910). Other bryologists active in New Jersey in the 1800's and early 1900's included Elizabeth G.

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Britton, Daniel C. Eaton, Alexander W. Evans, Thomas P. James, George N. Best and Eugene A. Rau. Between 1910 and 1940, notable collections were made by William H. Wiegmann, Alfred T. Beals, Hollis Koster, Bayard Long and Grace M. Tees. Edwin T. Moul and John E. Cantlon made a number of collections in the late 1940's and 1950's. Marion E.R. Robertson collected extensively in the 1960's; unfortunately many of her specimens were not identified and her collections have yet to be curated. Other active collectors in the period between 1960 and the present include Richard E. Andrus, Thomas S. Githens, Ted Gordon, Eric F. Karlin, Albert List, W.S.G. Maass, Clyde F. Reed and Gary L. Smith.

Several studies on mosses in New Jersey have been undertaken and many of these have been published. *Sphagnum* has received the most attention (Austin 1863; Andrews 1912 & 1915; Karlin & Andrus 1986 & 1988; Andrus & Karlin 1989), but other taxa and aspects of bryology have also been addressed (Austin 1874, 1876, 1877, 1879; Lawton 1951; Little 1951; Buell & Cantlon 1953; Hamilton 1953; Moul & Buell 1955; Bard 1965; Forman 1964, 1979a; Boerner & Forman 1975, Karlin 1990). Karlin (1992) has recently compiled the first published list of mosses occurring in the New Jersey Pine Barrens region. A number of vegetation studies have included data on the bryophyte component (Cantlon 1953; McCormick 1955; Wistendahl 1955; Olson 1979; Reed 1986). Although not focused on New Jersey, Crum & Anderson's (1981) treatment of eastern North American mosses is an invaluable source of information.

The Study Area. Although the fifth smallest state, New Jersey provides strong contrasts in both climate and physiography. The mountainous northwest corner of the state is much cooler (mean monthly temperatures: January -3°C, July 22°C) than the coastal area at the southern tip of the state (mean monthly temperatures: January 2°C, July 24°C). The frost free season (days >0°C) ranges from 129 days at Layton (Sussex Co.) to 231 days at Cape May (Cape May Co.). Although there is no major north/south gradient in the amount of total annual precipitation, there is a significant difference in the amount of precipitation received as snow. The northern portions of the state receive 1000-1300 mm, while southern New Jersey has 250-500 mm (Robichaud & Buell 1973; Dunlop 1974).

The southern 60% of New Jersey (hereafter referred to as southern New Jersey) lies in the Atlantic Coastal Plain region (Fig. 1). Elevations here are generally less than 30 m and sedimentary deposits of sands, silts and clays form the geologic substrate. The highest elevations (up to 114 m) are found in small hills which separate the Inner Coastal Plain from the Outer Coastal Plain. Three physiographic provinces occur in the northern 40% of New Jersey (hereafter referred to as northern New Jersey) (Fig. 1). The eastern half of northern New Jersey is in the Piedmont region, having a bedrock of shale, sandstone and argillite formations. Elevations are primarily less than 120 m, with the highest points occurring on a few ridge formations made of

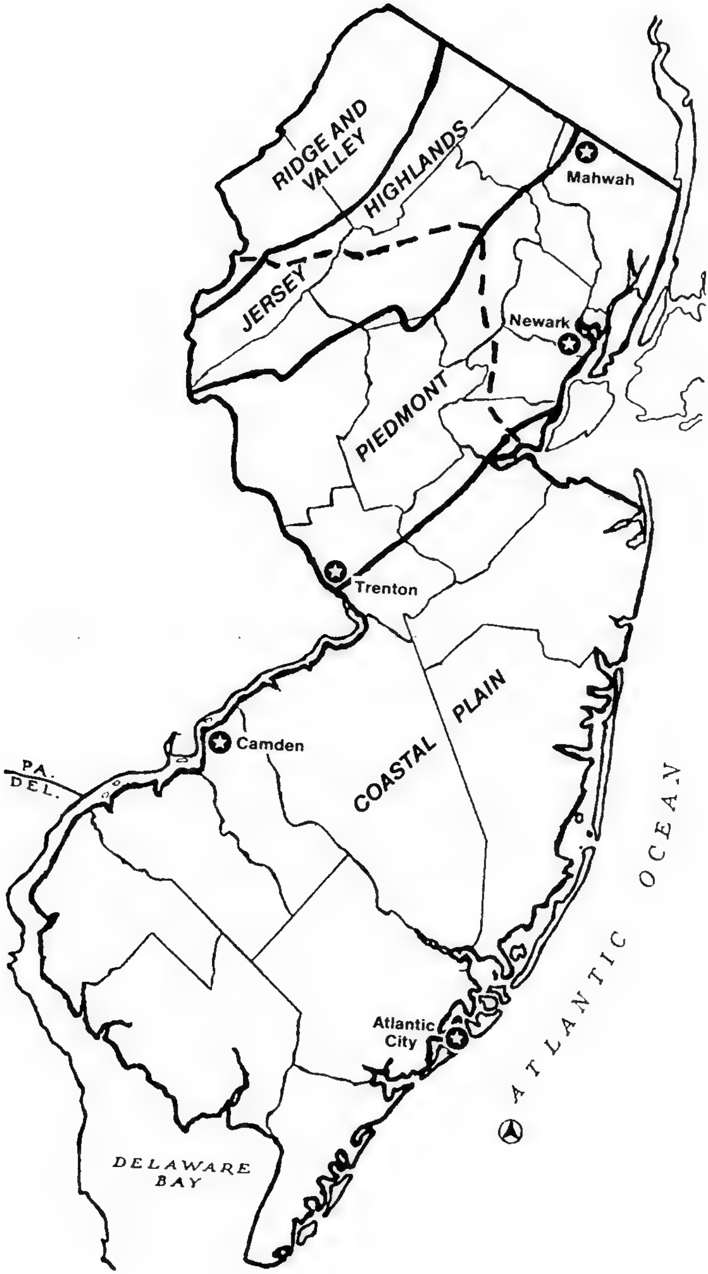

Figure 1. A map of New Jersey showing the four major physiographic regions. The dashed line indicates the terminal moraine of the Wisconsin ice sheet.

diabase and basalt (Watchung mts. - 259 m, Cushetunk Mt. - 254 m, the Palisades - 161 m). A system of parallel ridges and valleys occupies the western half of northern New Jersey where the Ridge and Valley province and the New Jersey Highlands province are found. Elevations here range from 105-550 m and include the highest spots in New Jersey. The valleys have a bedrock of limestone and shales, while that of the ridges is either composed of sandstone and conglomerate (Ridge and Valley province) or gneiss (New Jersey Highlands province).

The native vegetation of northern New Jersey is primarily oak forests of several types (mixed oak forest) while pine-oak forests predominate in southern New Jersey (Robichaud & Buell 1973). Wisconsin glaciation covered the most northerly part of the state (Fig. 1), and the effects of glaciation have had a significant influence on the ecosystems of northern New Jersey, especially in creating wetland habitats. In-depth discussions of the environment and ecosystems of New Jersey are available in Harshberger (1916), Kummel (1940), Biel (1958), Tedrow (1986), Widmer (1964), Robichaud & Buell (1973), Dunlop (1974) and Forman (1979b).

Methods. All available New Jersey moss specimens at the New York Botanical Garden (NY), Brooklyn Botanic Garden (BKL), Chrysler Herbarium at Rutgers University (CHRB), Philadelphia Academy of Science (PH), The State University of New York at Binghamton (BING) and Ramapo College were examined. In addition, the list was compared to the holdings of the Duke University Herbarium (DUKE). Nomenclature follows Anderson (1990) for *Sphagnum* and Anderson *et al.* (1990) for all other mosses.

Results and Discussion. A total of 366 species and 12 varieties (occurring in addition to the typical varieties) have been collected in New Jersey. This includes 30 species which have not previously been reported for the state (Britton 1889; Crum & Anderson 1981; Karlin & Andrus 1988).

There are three groupings of moss species based upon their distributional patterns within the state. One consists of those 180 taxa found in both southern and northern New Jersey. The second is composed of 24 taxa (12 of these being *Sphagnum*) restricted to southern New Jersey. Most of these taxa either reach the northern limits of their geographical distributions in southern New Jersey and/or have strong coastal plain affinities. The third group is comprised of 174 taxa that have been collected only in northern New Jersey. Although this pattern may in part be due to undercollecting, the disparity between the species richness of northern New Jersey (354 taxa) and southern New Jersey (204 taxa) is quite significant. The higher diversity of mosses in northern New Jersey is in large part due to the greater diversity of habitats that occur there, especially in regard to geologic substrates and physiographic relief.

Ditrichum ambiguum is represented in New Jersey by one collection from a serpentine habitat (Reed 75239 (US, REED)), and was identified by Harold Robinson as being *Ditrichum tortuloides* Grout. Although listed in synonymy with *D. ambiguum* by Anderson *et al.* (1990), *D. tortuloides* and *D. ambiguum* are viewed by some as being distinct species (Harold Robinson, personal communication), with *D. ambiguum* being endemic to the Pacific Northwest (Robert Ireland, personal communication).

Oncophorus wahlenbergii Brid., not included on the list below, may have also been collected in New Jersey. According to her collection notes, Marion Robertson collected this species in Burlington Co. (Robertson 4769). Unfortunately, it was not possible to locate the specimen for verification. Another collection of interest is a depauperate specimen (Musci Novae-Caesarenses 269, "rocky open banks, Palisades and Little Falls, rare") which was identified by Austin as *Bartramidula wilsonii* Bruch. & Schimp. A.J. Sharp examined this specimen in 1938 and felt that it might be a juvenile form of *Philonotis longiseta* (Michx.) Britt. The occurrence of either species in New Jersey would represent a significant range extension (Crum & Anderson 1981). However, the senior author and Bill Buck did not find it to be either of these two taxa. Although the collection is not sufficently developed for an adequate determination to be made, it appears to be *P. marchica*, which is represented by other New Jersey collections.

About 40% of New Jersey's mosses are currently only known from historical collections (153 taxa were last collected prior to 1950, of these, 101 were last collected in the 1800's). In addition, aside from the work of Karlin & Andrus (1988) on *Sphagnum*, a systematic field survey to determine the abundance and distribution of moss species in the state has never been undertaken. More than half of the New Jersey moss flora (247 taxa) are known from ≤ 10 sites, and it is likely that many of these taxa are simply undercollected in New Jersey and are not actually rare. Thus a database sufficient for the determination of the rare and endangered status of New Jersey mosses exists currently only for *Sphagnum* (Andrus & Karlin 1989; Karlin 1990), and nine species of *Sphagnum* have recently been placed on the state's list of endangered plant species. However, a preliminary assessment of a species' rarity in New Jersey is possible (see Selected Specimens Examined section below). As this determination is based largely on historical herbarium records, it should be viewed only as a means to highlight both those mosses at highest risk of extirpation in New Jersey and those which have been notably undercollected. Both verification of whether or not the populations still exist at the original sites of collection and explorations to determine if other populations exist elsewhere in the state need to be undertaken in order to establish the current status of rarity and endangerment for these mosses in New Jersey. Field surveys will not only serve to determine which of these species are actually rare in New Jersey, they will also likely uncover a number of species not presently known from the state. For instance, field surveys have recently uncovered 7 species of *Sphagnum* not previously reported for New Jersey (Karlin & Andrus (1988) and 12 species of *Sphagnum* new to Delaware (Karlin, Andrus & Reed 1991).

Selected Specimens Examined. New state records are indicated by an asterisk. The general distribution of each species in New Jersey is indicated as follows: T = found in both northern and southern New Jersey; N = found in northern New Jersey only; S = found in southern New Jersey only. The general date of the most recent collection for each species is indicated by: A = collected between 1975 and 1991; B = collected between 1950 and 1974; C = collected between 1900 and 1949; D = collected prior to 1900. Taxa known from ≤ 10 sites, both current and historical, in New Jersey are indicated by either **S1** (limited to ≤ 5 sites) or **S1/2** (occurring in 6-10 sites). This system of ranking is adapted from the one used by the New Jersey Natural Heritage Program (Breden 1989). To save space, the following abbreviations are used: NJ = no location given other than New Jersey; SNJ = location given as southern New Jersey or the Pine Barrens region; NNJ = location given as northern New Jersey; MNC = Austin's Musci Novae-Caesarenses; MA = Austin's Musci Appalachiani.

- **Abietinella** (Thuidiaceae)
  - *abietina* (Hedw.) Fleisch. (N,B,S1) - SUSSEX: *MNC 370* (NY), *Wiegmann 164* (BKL); WARREN: *Robertson 4453* (PH).
- **Acaulon** (Pottiaceae)
  - *muticum* (Hedw.) C. Müll. (T,D,S1) - NJ: *MA 51* (NY); BERGEN: *Austin*, 1871 (NY); CAMDEN: *Austin*, 1868 (NY).
- **Amblystegium** (Amblystegiaceae)
  - *serpens* (Hedw.) Schimp. (N,B) - BERGEN: *Wiegmann 1199* (NY); MORRIS: *Moul 6775* (CHRB).
    - var. *juratzkanum* (Schimp.) Rau & Herv. (T,B,S1) - BERGEN: *Wiegmann*, 1914 (NY); SALEM: *Robertson 2684* (PH).
  - *varium* (Hedw.) Lindb. (T,B) - HUNTERDON: *Best*, 1896 (NY); SUSSEX: *Wiegmann*, 1916 (NY).
- **Amphidium** (Orthotrichaceae)
  - *lapponicum* (Hedw.) Schimp. (N,D,S1) - NNJ: *MA 154* (NY); MORRIS: *Austin*, 1867 (NY).
  - *mougeotii* (Bruch & Schimp.) Schimp. (N,D,S1) - WARREN: *Austin*, 1867 (NY), *Rau*, 1874 (NY).
- **Anacamptodon** (Fabroniaceae)
  - *splachnoides* (Brid.) Brid. (T,B,S1) - BERGEN: *Beals*, 1930 (NY); CAMDEN: *Forman*, 1960 (CHRB).
- **Andreaea** (Andreaeaceae)
  - *rothii* Web. & Mohr (N,A,S1) - SUSSEX: *Wallace 82-0048* (CHRB); WARREN: *MNC 46 & 47* (NY), *Karlin 9108-0701* (NY).
  - *rupestris* Hedw. (N,B,S1) - BERGEN: *MNC 45* (NY); SUSSEX: *Webster*, 1968 (CHRB).
- **Anomodon** (Anomodontaceae)
  - *attenuatus* (Hedw.) Hub. (T,A) - SALEM: *Long 1771* (PH); SUSSEX: *Wiegmann 829* (NY).
  - *minor* (Hedw.) Fürnr. (N,B,S1/2) - BERGEN: *MNC 336* (NY); SUSSEX: *Britton*, 1889 (NY); WARREN: *Robertson 4473* (PH).
  - *rostratus* (Hedw.) Schimp. (T,B) - CAPE MAY: *Long 668* (PH); WARREN: *Smith 2441* (NY);
  - *rugelii* (C. Müll.) Keissl. (N,B,S1) - BERGEN: *Austin*, 1871 (NY).

viticulosus (Hedw.) Hook. & Tayl. (N,B,S1) - HUNTERDON: *Moul 6781* (CHRB); SUSSEX: *MA 278* (NY).

Aphanorrhegma (Funariaceae)

serratum (Hook. f. & Wils.) Sull. (N,C,S1) - NJ: *MNC 199* (NY); BERGEN: *Austin*, 1868 (CHRB).

Archidium (Archidiaceae)

ohioense Schimp. ex C. Müll. (N,D,S1) - NJ: *MA 44* (NY); BERGEN: *MNC 49* (NY), *Austin*, 1876 (NY).

Astomum (Pottiaceae)

muehlenbergianum (Sw.) Grout (N,C,S1) - BERGEN: *MNC 66* (NY); PASSAIC: *Beals*, 1921 (NY).

Atrichum (Polytrichaceae)

altecristatum (Ren. & Card.) Smyth & Smyth (T,A,?) - BERGEN: *Karlin 9105-0201* (Ramapo); CUMBERLAND: *Long 729* (NY).

angustatum (Brid.) Bruch & Schimp. (T,A) - BERGEN *Karlin 9101-0202* (Ramapo); OCEAN: *Smith 2459* (NY);

crispum (James) Sull. (T,A) - CAMDEN: *MNC 274* (NY); MIDDLESEX: *Wiegmann 44* (NY).

oerstedianum (C. Müll.) Mitt. (N,A,?) - BERGEN: *Austin*, 1868 (NY); WARREN: *Smith 2414* (NY).

Aulacomnium (Aulacomniaceae)

heterostichum (Hedw.) Bruch & Schimp. (T,B) - NJ: *MA 220* (NY); BERGEN: *Britton*, 1899 (NY); OCEAN: *Long 2223* (PH).

palustre (Hedw.) Schwaegr. (T,A) - BERGEN: *MA 219* (NY); BURLINGTON: *Rau*, 1880 (NY); WARREN: *Karlin 9103-2606* (Ramapo).

Barbula (Pottiaceae)

convoluta Hedw. (T,D,S1/2) - BERGEN: *MNC 144* (NY); SOMERSET: *Austin*, 1868 (NY).

indica (Hook.) Spreng. (N,D,S1) - BERGEN: *MNC 154* (NY).

unguiculata Hedw. (T,B) - BERGEN: *Clausen*, 1941 (NY); BURLINGTON: *Koster*, 1939 (NY).

Bartramia (Bartramiaceae)

pomiformis Hedw. (T,A) - HUNTERDON: *Moul 8573* (NY); SUSSEX: *Wiegmann 823* (NY).

Brachythecium (Brachytheciaceae)

acutum (Mitt.) Sull. (N,C,S1/2) - BERGEN: *MA 316* (NY), *Beals 1119* (NY); HUNTERDON: *Best*, 1891 (NY).

acuminatum (Hedw.) Aust. (N,B,S1/2) - BERGEN: *Wiegmann 176* (NY); HUNTERDON: *Best*, 1893 (NY).

campestre (C. Müll.) Schimp. (T,C) - BERGEN: *MA 315* (NY); BURLINGTON: *Koster*, 1939 (NY).

digastrum C. Müll. & Kindb. (N,D,S1) - HUNTERDON: *Best*, Raven Rock (NY).

oedipodium (Mitt.) Jaeg. (N,D,S1) - SUSSEX: *Austin*, 1866 (NY); WARREN: *MA 323* (NY).

oxycladon (Brid.) Jaeg. (T,B) - BERGEN: *Austin*, 1877 (NY); BURLINGTON: *Robertson 7697* (PH); SUSSEX: *Wiegmann 142* (NY).

plumosum (Hedw.) Schimp. (T,C) - BERGEN: *MA 326* (NY); OCEAN: *Austin*, 1868 (NY).

populeum (Hedw.) Schimp. (N,B,S1) - BERGEN: *Austin*, 1888 (NY); HUNTERDON: *Cantlon 127* (CHRB).

rivulare Schimp. (N,C,S1/2) - BERGEN: *MA 319* (NY), *Wiegmann*, 1935 (NY); HUNTERDON: *Best*, 1896 (NY).

rutabulum (Hedw.) Schimp. (T,C) - BERGEN: *Wiegmann 91* (NY); CUMBERLAND: *Long 1417* (PH); HUNTERDON: *Best*, 1892 (NY).

salebrosum (Web.& Mohr.) Schimp. (T,B) - HUNTERDON: *Cantlon 130* (CHRB); SUSSEX: *Austin*, 1867 (NY).

velutinum (Hedw.) Schimp. (N,D,S1) - BERGEN: *Austin*, 1866 (NY); HUNTERDON: *Best*, 1896 (NY).

Brotherella (Sematophyllaceae)
recurvans (Michx.) Fleisch. (T,B) - BURLINGTON: *Robertson 5738* (PH); SUSSEX: *Karlin M9003-1010* (Ramapo); WARREN: *Moul 62-153* (CHRB).
Bruchia (Bruchiaceae)
flexuosa (Schwaegr.) C. Müll. (T,C,S1/2) - BERGEN: *MNC 65* (NY), *Britton*, 1886 (NY); GLOUCESTER: *Rau*, 1882 (NY).
Bryhnia (Brachytheciaceae)
graminicolor (Brid.) Grout (N,C,S1/2) - HUNTERDON: *Best*, 1910 (NY); SUSSEX: *Wiegmann 129* (NY).
novae-angliae (Sull. & Lesq.) Grout (T,A) - NJ: *MA 330* (NY); SALEM: *Robertson 2681* (PH); SUSSEX: *Snyder*, 1991 (Ramapo).
Bryoandersonia (Brachytheciaceae)
illecebra (Hedw.) Robins. (T,B) - NJ: *MA 331* (NY); CAPE MAY: *Long 1687* (PH); SOMERSET: *Moul 7301* (NY).
Bryoerythrophyllum (Pottiaceae)
recurvirostre (Hedw.) Chen (T,B,S1) - NJ: *MA 113* (NY); BURLINGTON: *Robertson 4121* (PH); SOMERSET: *Moul 6640* (PH).
Bryohaplocladium (Leskeaceae)
microphyllum (Hedw.) Wat. & Iwats. (S,B,S1) - GLOUCESTER: *Long 2113* (PH); OCEAN: *Robertson 4342 & 4291* (PH).
virginianum (Brid.) Wat. & Iwats. (T,B) - HUNTERDON: *Best*, 1904 (NY); SALEM: *Long 2079* (PH).
Bryum (Bryaceae)
algovicum C. Müll (N,D,S1) - BERGEN: *MA 196* (NY), *Austin*, 1863 (NY).
argenteum Hedw. (T,B) - BURLINGTON: *Robertson 4626* (PH); SUSSEX: *Moul 11053* (CHRB).
caespiticium Hedw. (T,A) - CUMBERLAND: *Long 1180* (PH); SUSSEX: *Wiegmann 903* (NY).
capillare Hedw. (T,B,S1/2) - NJ: *MA 199* (NY); HUNTERDON: *Moul 6245* (CHRB); MORRIS/SUSSEX: *Britton*, 1886 (NY).
cyclophyllum (Schwaegr.) Bruch & Schimp. (N,D,S1) - BERGEN: *MA 192* (NY), *MNC 218* (NY), *Austin*, 1878 (NY).
dichotomum Hedw. (N,D,S1) - BERGEN: *Austin*, 1875 (NY).
lisae De Not. var. *cuspidatum* (Bruch & Schimp.) Marg. (T,B,S1) - MIDDLESEX: *Moul 7377* (CHRB); SUSSEX: *Githens*, 1962 (PH).
**muehlenbeckii* Bruch & Schimp. (N,C,S1) - BERGEN: *Beals*, 1918 (NY,PH).
pseudotriquetrum (Hedw.) Gaertn. *et al.* (T,A) - BERGEN: *MA 195* (NY); MIDDLESEX: *Moul 8729* (CHRB).
radiculosum Brid. (N,C,S1) - BERGEN & WARREN: *MNC 216* (NY); PASSAIC: *Miller*, 1932 (NY).
**uliginosum* (Brid.) Bruch & Schimp. (T,D,S1/2) - BERGEN: *MNC 217* (NY); OCEAN: *Austin*, 1868 (NY); PASSAIC: *Britton*, 1886 (CHRB).
Buxbaumia (Buxbaumiaceae)
aphylla Hedw. (T,A) - GLOUCESTER: *Rau*, 1882 (NY); HUNTERDON: *Cantlon 331* (CHRB); WARREN: *Britton*, 1884 (NY).
Callicladium (Hypnaceae)
haldanianum (Grev.) Crum (T,A) - BERGEN: *Wiegmann 1230* (NY); HUNTERDON: *Moul 7831* (NY).
Calliergon (Amblystegiaceae)
cordifolium (Hedw.) Kindb. (N,A,S1/2) - BERGEN: *Austin*, 1869 (NY); SUSSEX: *Karlin 9103-0201* (Ramapo).
**gigantum* (Schimp.) Kindb. (N,A,S1) - SUSSEX: *Garberi*, near Franklin (NY,PH); WARREN: *Karlin 9103-2619* (Ramapo).
Calliergonella (Amblystegiaceae)
cuspidata (Hedw.) Loeske (T,A,S1/2) - BURLINGTON: *Robertson 4439* (PH); SUSSEX: *Karlin 9103-0206* (Ramapo); WARREN: *Beals*, 1938 (NY).
Campylium (Amblystegiaceae)
chrysophyllum (Brid.) J. Lange (T,A,S1/2) - BURLINGTON: *Zanoni 4874* (NY);

WARREN: *Beals*, 1938 (NY).

hispidulum (Brid.) Mitt. (T,B) - CAPE MAY: *Long 1230* (PH); SUSSEX: *Austin*, 1868 (NY).

polygamum (Schimp.) C. Jens. (N,D,S1) - BERGEN: *MNC 471* (NY), *Austin*, 1869 (NY).

radicale (P. Beauv.) Grout (T,C,S1/2) - BERGEN: *MA 391* (NY); CUMBERLAND: *Long 769* (PH).

stellatum (Hedw.) C. Jens. (T,A,S1/2) - SALEM: *Long 999a* (PH); SUSSEX: *Wiegmann 149* (NY); WARREN: *Karlin 9103-2615* (Ramapo).

Campylostelium (Ptychomitriaceae)

saxicola (Web.& Mohr) Bruch & Schimp. (N,D,S1) - BERGEN: *MA 109* (NY); *MNC 129* (NY); *Austin*, 1869 (NY).

Ceratodon (Ditrichaceae)

purpureus (Hedw.) Brid. (T,A) - BERGEN: *Wiegmann 1005* (NY); OCEAN: *Moul 2672* (NY).

Cirriphyllum (Brachytheciaceae)

piliferum (Hedw.) Grout (N,D,S1) - BERGEN: *MNC 405* (NY), *Austin*, 1866 (NY).

Clasmatodon (Fabroniaceae)

parvulus (Hampe) Hook. & Wils. (N,D,S1) - WARREN: *MNC 340* (NY).

Climacium (Climaciaceae)

americanum Brid. (T,A) - CUMBERLAND: *Long 1128*(PH); ESSEX: *Wiegmann 758* (NY); SUSSEX: *Githens*, 1962 (PH).

**dendroides* (Hedw.) Web. & Mohr (T,B,S1) - BERGEN & OCEAN: *MA 286* (NY), *MNC 348* (NY); WARREN: *Schaeffer 134* (NY).

kindbergii (Ren. & Card.) Grout (T,A) - BERGEN: *MA 288 & 289*(NY); CUMBERLAND: *Long 1454* (PH); SUSSEX: *Hoiberg*, 1960 (CHRB).

Cratoneuron (Amblystegiaceae)

filicinum (Hedw.) Spruce (T,A,S1/2) - MONMOUTH: *Britton*, 1882 (CHRB); PASSAIC: *Nash*, 1890 (NY); SUSSEX: *Karlin 8809-2401* (Ramapo).

Cryphaea (Cryphaeaceae)

glomerata Bruch & Schimp. (T,D,S1) - BERGEN: *MNC 305* (NY), *MA 253* (NY); BURLINGTON: *Austin*, 1855 (NY).

Ctenidium (Hypnaceae)

malacodes Mitt. (N,B,S1/2) - BERGEN: *Austin*, 1864 (NY); HUNTERDON: *Moul 6743* (CHRB); UNION: *Beals*, 1933 (NY).

Cyrto-hypnum (Thuidiaceae)

minutulum (Hedw.) Buck & Crum (N,B,S1) - BERGEN: *Austin*, 1867 (NY); SUSSEX: *Austin*, 1867 (NY); WARREN: *Robertson 7123* (PH).

pygmaeum (Schimp.) Buck & Crum (N,C,S1) - BERGEN & SUSSEX: *MNC 362* (NY); HUNTERDON: *Best*, 1902 (NY).

Desmatodon (Pottiaceae)

obtusifolius (Schwaegr.) Schimp. (T,D,S1) - BERGEN: *MA 122* (NY).

porteri James (N,C,S1) - SUSSEX: *Bartram 648* (NY).

Dichelyma (Fontinalaceae)

capillaceum (With.) Myr. (N,D,S1) - BERGEN: *MNC 303* (NY); *Austin*, 1877 (NY).

Dichodontium (Dicranaceae)

pellucidum (Hedw.) Schimp. (N,D,S1) - PASSAIC: *Austin*, 1867 (NY); SUSSEX: *MNC 83* (NY), *MA 76* (NY).

Dicranella (Dicranaceae)

cerviculata (Hedw.) Schimp. (S,D,S1) - SNJ: *Austin*, 1865 (NY); BURLINGTON: *MNC 85* (NY).

heteromalla (Hedw.) Schimp. (T,A) - BERGEN: *Wiegmann 264* (NY); MIDDLESEX: *Moul 7297* (NY).

rufescens (With.) Schimp. (T,B,S1) - NNJ: *MA 74* (NY), *MNC 86* (NY); MONMOUTH: *Britton*, 1886 (CHRB); SOMERSET: *Wistendahl 27* (CHRB).

schreberiana (Hedw.) Hilf. var. *robusta* (Schimp.) Crum & Anderson (N,D,S1) - BERGEN: *MNC 84* (NY), *MA 77* (NY); *Austin*, 1867 (NY).

varia (Hedw.) Schimp. (T,D,S1/2) - BERGEN: *MA 78* (NY), *Austin*, 1867 (NY); HUNTERDON: *Best*, 1893 (NY).

Dicranum (Dicranaceae)

condensatum Hedw. (T,B) - SNJ: *MA 96* (NY); BURLINGTON: *Best*, 1892 (NY); OCEAN: *Robertson 2978* (PH).

flagellare Hedw. (T,A) - BURLINGTON: *Best*, 1897 (NY); HUNTERDON: *Best*, 1893 (NY).

fulvum Hook. (T,A) - BURLINGTON: *Stair*, 1940 (PH); WARREN: *Webster*, 1968 (CHRB).

fuscescens Turn. (T,B,S1) - HUNTERDON: *Cantlon & Moul 6290* (CHRB); MORRIS: *Moul 62-98* (CHRB).

montanum Hedw. (T,B) - BERGEN: *Austin*, 1871 (NY); MIDDLESEX: *Webster*, 1968 (CHRB); SALEM: *Long 1054* (PH).

muehlenbeckii Bruch & Schimp. (N,C,S1) - PASSAIC: *Austin*, 1867 (NY); SUSSEX: *Wiegmann 141* (NY).

ontariense Peters. (S,B,S1) - SNJ: *MNC 114* (NY); OCEAN: *Robertson 7116* (PH).

polysetum Sw. (T,A,S1/2) - BERGEN: *MA 97* (NY); CUMBERLAND: *Robertson 3143* (PH); SUSSEX: *Nash*, 1909 (NY).

rhabdocarpum Sull. (N,B,S1) - MORRIS: *W.B.*, 1970 (CHRB); SUSSEX: *Austin*, 1866 (NY).

scoparium Hedw. (T,A) - BERGEN: *MA 88 & 89* (NY); MERCER: *Tees 28* (PH); MIDDLESEX: *Moul 6717* (CHRB).

spurium Hedw. (T,A) - NNJ: *MA 95* (NY); CAMDEN: *Robertson 6688* (PH); SUSSEX: *Webster*, 1968 (CHRB).

**undulatum* Brid. (N,C,S1/2) - BERGEN: *Austin*, 1867 (NY); HUNTERDON: *Best*, 1891 (NY).

viride (Sull. & Lesq.) Lindb. (N,B,S1) - NJ: *MNC 92* (NY); SUSSEX: *Webster*, 1968 (CHRB).

Didymodon (Pottiaceae)

fallax (Hedw.) Zand. (T,B,S1/2) - BERGEN: *MA 125* (NY); BURLINGTON: *Robertson 4811* (PH).

var. *reflexus* (Brid.) Zand. (N,D,S1) - HUDSON: *MA Suppl. 496* (NY).

Diphyscium (Buxbaumiaceae)

foliosum (Hedw.) Mohr. (T,B) - CAMDEN: *Long 1457* (PH); PASSAIC: *Knight*, 1882 (NY); SOMERSET: *Moul 7765* (CHRB, NY).

Discelium (Disceliaceae)

nudum (Dicks.) Brid. (N,D,S1) - HUNTERDON: *Best*, 1896 (NY), *Best*, 1897 (NY).

Ditrichum (Ditrichaceae)

**ambiguum* Best (N,B,S1) - MORRIS: *Reed 75239* (REED).

lineare (Sw.) Lindb. (T,B) - NJ: *MA 119* (NY); BERGEN: *Grout 31* (NY); BURLINGTON: *Robertson 7644* (PH).

pallidum (Hedw.) Hampe (T,B) - CAPE MAY: *Long*, 1933 (NY); HUNTERDON: *Cantlon*, 1949 (NY).

pusillum (Hedw.) Hampe (T,C) - ESSEX: *Wiegmann*, 1917 (NY); HUNTERDON: *Best*, 1893 (NY).

Drepanocladus (Amblystegiaceae)

aduncus (Hedw.) Warnst. (N,B,S1) - MORRIS: *Small*, 1894 (CHRB); SUSSEX: *Webster*, 1968 (CHRB); WARREN: *Karlin 9108-0703* (Ramapo).

var. *kneiffii* (Schimp.) Monk. (N,D,S1) - BERGEN: *MNC 481-483* (NY); MORRIS: *MNC 484* (NY).

var. *polycarpus* (Bland.) G. Roth (N,D,S1) - BERGEN: *MNC 479-480* (NY); SUSSEX: *MNC 477* (NY).

Drummondia (Orthotrichaceae)

prorepens (Hedw.) E.G. Britt. (T,D,S1/2) - BERGEN: *Britton*, 1886 (CHRB); GLOUCESTER: *Rau*, 1890 (NY).

Encalypta (Encalyptaceae)

procera Bruch (N,C,S1) - SUSSEX: *MA 175* (NY), *MNC 195* (NY), *Best*, 1907 (NY).

Entodon (Entodontaceae)

brevisetus (Hook. & Wils.) Lindb. (N,D,S1) - BERGEN: *MA 285*(NY); HUNTERDON: *Best*, 1871 (NY).

cladorrhizans (Hedw.) C. Müll. (T,B,S1/2) - ATLANTIC: *Long 1994* (PH); BERGEN: *MA 284* (NY); SUSSEX: *Webster*, 1968 (CHRB).
**compressus* (Hedw.) C. Müll. (S,C,S1) - OCEAN: *Beals*, 1942 (NY).
seductrix (Hedw.) C. Müll. (T,B) - HUNTERDON: *Best*, 1904 (NY); MIDDLESEX: *Webster*, 1968 (CHRB); SALEM: *Long 1593* (PH).

Ephemerum (Ephemeraceae)
crassinervium (Schwaegr.) Hampe (T,D,S1) - BERGEN: *MNC 55 & 56* (NY); CAMDEN: *Austin*, 1868 (NY).
serratum (Hedw.) Hampe (N,D,S1) - BERGEN: *MA 47b* (NY), *Austin*, 1864 (NY).
spinulosum Bruch & Schimp. (T,D,S1) - BERGEN: *Austin* (NY); CAMDEN: *Austin*, 1868 (NY).

Eurhynchium (Brachytheciaceae)
hians (Hedw.) Sande Lac. (N,B) - BERGEN: *MA 335* (NY); HUNTERDON: *Moul & Cantlon 187* (CHRB).
pulchellum (Hedw.) Jenn. (N,B) - HUNTERDON: *Moul 6744* (CHRB); SALEM: *Long 5776* (PH).

Fabronia (Fabroniaceae)
ciliaris (Brid.) Brid. (N,D,S1) - WARREN: *MNC 338* (NY), *MA, Suppl. I, 535* (NY).

Fissidens (Fissidentaceae)
adianthoides Hedw. (N,A) - ESSEX: *Wiegmann 169* (NY); SUSSEX: *Karlin 8709-2801* (Ramapo); MORRIS: *Britton*, 1883 (NY).
bryoides Hedw. (T,B) - BURLINGTON: *Robertson 4807* (PH); HUNTERDON: *Best*, 1890 (NY); SUSSEX: *Britton*, 1887 (NY).
closteri Aust. (N,D,S1) - BERGEN: *MNC 116* (NY), *Austin*, 1875 (NY).
dubius P. Beauv. (T,A,S1/2) - BURLINGTON: *Zanoni 4870* (NY); UNION: *Wiegmann 171* (NY).
fontanus (B. Pyl.) Steud. (T,B,S1/2) - BERGEN: *MNC 127* (NY); BURLINGTON: *Robertson 4790* (PH); ESSEX: *Wiegmann*, 1916 (NY).
hallianus (Sull. & Lesq.) Mitt. (N,D,S1) - PASSAIC: *Austin*, 1867 (CHRB); SUSSEX: *MNC 128* (NY), *Austin*, 1867 (NY).
obtusifolius Wils. (N,C,S1) - WARREN: *Schaeffer 148* (PH).
osmundioides Hedw. (N,C,S1/2) - BERGEN: *MA 104* (NY); HUNTERDON: *Cantlon & Moul 879* (CHRB); WARREN: *Austin*, 1871 (NY).
subbasilaris Hedw. (N,D,S1) - BERGEN & SUSSEX: *MNC 122* (NY), *MA 105* (NY); HUNTERDON: *Best*, 1891 (NY).
taxifolius Hedw. (N,A) - PASSAIC: *Best*, 1889 (NY); UNION: *Wiegmann 93* (NY); WARREN: *Karlin 9103-2613* (Ramapo).

Fontinalis (Fontinalaceae)
**antipyretica* Hedw. (N,B,S1) - SUSSEX: *Webster*, 1968 (CHRB).
var. *gigantea* (Sull.) Sull. (N,B,S1/2) - BERGEN: *Austin*, 1872 (NY); SUSSEX: *Moul 7440* (NY,CHRB).
dalecarlica Schimp. (N,A,S1/2) - BERGEN: *Austin*, 1863 (BKL); MORRIS: *Britton*, 1882 (NY); WARREN: *Karlin 9108-0702* (MO).
**flaccida* Ren. & Card. (T,A,S1) - SNJ: *MA 246* (NY); ATLANTIC: *Kaiser*, 1914 (NY); SUSSEX: *Karlin 9003-1001* (Ramapo).
**hypnoides* Hartm. (T,A,S1) - CUMBERLAND: *Forman*, 1976 (PH); SUSSEX: *Karlin 8707-0301* (Ramapo).
var. *duriaei* (Schimp.) Husn. (N,B,S1) - SUSSEX: *?*, 1970 (CHRB).
novae-angliae Sull. (T,A) - NNJ: *MA 248* (NY); SNJ: *MA 246* (NY); BERGEN: *Eaton 1882* (NY); CUMBERLAND: *Long 1516* (PH).
var. *cymbifolia* (Aust.) Welch (T,C,S1/2) - OCEAN: *MA 248* (NY); SUSSEX: *Austin*, 1865 (NY).
sullivantii Lindb. (T,B,S1/2) - BERGEN: *MA 249* (NY); SALEM: *MacElwee 1895* (NY, PH); SUSSEX: *Hoiberg 163* (CHRB).

Forsstroemia (Leptodontaceae)
trichomitria (Hedw.) Lindb. (T,B,S1) - BERGEN: *MA 254* (NY); HUNTERDON: *Best*, 1894 (NY); SALEM: *Robertson 2699* (PH).

Funaria (Funariaceae)
flavicans Michx. (T,C,S1) - BERGEN: *MA 183* (NY),*MNC 205* (NY); CUMBERLAND: *Long 1925* (PH).
hygrometrica Hedw. (T,A) - BERGEN: *Austin*, 1865 (NY); MIDDLESEX: *Webster*, 1968 (CHRB); SALEM: *Long 1192* (PH).
Grimmia (Grimmiaceae)
laevigata (Brid.) Brid. (N,D,S1) - BERGEN: *MA 146* (NY); PASSAIC: *? 1897* (NY).
olneyi Sull. (N,C,S1/2) - BERGEN: *MA 144 & 145* (NY); PASSAIC: *Britton & Britton*, 1882 (NY).
pilifera P. Beauv. (N,B) - NNJ: *MA 143* (NY); MERCER: *Tees 51* (PH); MORRIS: *Moul 6196* (CHRB).
Gymnostomum (Pottiaceae)
aeruginosum Sm. (N,C,S1/2) - NJ: *MNC 70* (NY); BERGEN: *Austin*, 1869 (NY); WARREN: *Kaiser*, 1911 (PH).
Hamatocaulis (Amblystegiaceae)
**vernicosus* (Mitt.) Hedenas (N,C,S1) - BERGEN: *Austin*, 1874 (NY); MORRIS: *Austin*, 1867 (NY); WARREN: *Wiegmann 416* (NY).
Haplohymenium (Anomodontaceae)
triste (Ces.) Kindb. (T,A,S1/2) - CUMBERLAND: *Long 1295* (PH); HUNTERDON: *Best*, 1899 (NY).
Hedwigia (Hedwigiaceae)
ciliata (Hedw.) P. Beauv. (N,A) - HUNTERDON: *Cantlon 322* (CHRB); SUSSEX: *Webster*, 1968 (CHRB); UNION: *Wiegmann 482* (NY).
Helodium (Helodiaceae)
**blandowii* (Web. & Mohr.) Warnst. (N,A,S1) - SUSSEX: *MNC 371* (NY); WARREN: *Karlin 9103-2612* (Ramapo).
var. *helodioides* (Ren. & Card.) Crum *et al.* (N,A,S1) - SUSSEX: *Karlin 8709-2430* (Ramapo); WARREN: *Karlin 8711-0501* (Ramapo).
paludosum (Sull.) Aust. (T,A,S1/2) - MERCER: *Long 565* (PH); MORRIS: *Wiegmann 63* (NY); OCEAN: *Karlin 8710-1502* (Ramapo).
Herzogiella (Hypnaceae)
striatella (Brid.) Iwats. (T,B) - BERGEN: *MNC 428* (NY); OCEAN: *Robertson 7118* (PH).
turfacea (Lindb.) Iwats. (T,B,S1/2) - BURLINGTON: *Stair*, 1940 (PH); HUNTERDON: *Best*, 1890 (NY);SUSSEX: *Wiegmann 163* (NY).
Homalia (Neckeraceae)
trichomanoides (Hedw.) Schimp. (N,B,S1) - SOMERSET: *Stephenson*, 1962 (CHRB).
Homalotheciella (Brachytheciaceae)
subcapillata (Hedw.) Broth. (T,C,S1/2) - ATLANTIC: *Long 2165* (PH); BERGEN: *Austin*, 1867 (NY); HUNTERDON: *Best*, 1895 (NY).
Homomallium (Hypnaceae)
adnatum (Hedw.) Broth. (N,B,S1) - BERGEN: *Wiegmann 456* (NY); HUNTERDON: *Moul 6241* (CHRB); SUSSEX: *Britton*, 1897 (NY).
Hygroamblystegium (Amblystegiaceae)
fluviatile (Hedw.) Loeske (N,A) - BERGEN: *MA 386* (NY); ESSEX: *Wiegmann 1184* (NY); SUSSEX: *Adams & Wherry 1551a* (PH).
noterophilum (Sull. & Lesq.) Warnst. (N,D,S1) - SUSSEX: *MNC 454* (NY); NJ: *Grout, No. Amer. Musci Pleur. 487* (BKL).
tenax (Hedw.) Jenn. (N,A) - BERGEN: *Karlin 9004-1204* (Ramapo); HUNTERDON: *Best*, 1902 (NY); SUSSEX: *Austin*, 1867 (NY).
Hygrohypnum (Amblystegiaceae)
closteri (Aust.) Grout (N,D,S1) - BERGEN: *MNC 515* (NY), *Austin*, 1872 (NY).
eugyrium (Schimp.) Loeske (N,D,S1) - WARREN: *MNC 514* (NY), *Austin*, 1871 (NY).
luridum (Hedw.) Jenn. (N,D,S1) - SUSSEX: *MNC 511* (NY), *Austin*, 1867 (NY).
micans (Mitt.) Broth. (N,D,S1) - SUSSEX: *MA 440* (NY).
molle (Hedw.) Loeske (N,C,S1) - ESSEX: *Wiegmann 757* (NY); SUSSEX: *MNC 512* (NY).
ochraceum (Wils.) Loeske (N,D,S1) - NJ: *Rau* (NY); HUNTERDON: *Best*, 1894 (NY).
Hylocomiastrum (Hylocomiaceae)
umbratum (Hedw.) Fleisch. (N,D,S1) - BERGEN: *Austin*, 1864 (BKL).

Hylocomium (Hylocomiaceae)
splendens (Hedw.) Schimp. (N,A,**S1/2**) - NNJ: *MA 447* (NY); HUNTERDON: *Best*, 1895 (NY); SUSSEX: *Karlin 8809-0806* (Ramapo).

Hymenostylium (Pottiaceae)
recurvirostre (Hedw.) Dix. (N,D,**S1**) - BERGEN: *MA 61* (NY), *MNC 71* (NY); PASSAIC: *Austin*, 1867 (NY).

Hyophila (Pottiaceae)
involuta (Hook.) Jaeg. (N,C,**S1/2**) - BERGEN: *MNC 132* (NY); PASSAIC: *Austin*, 1867 (NY); SUSSEX: *Holzinger, Musci Acro. Bor.-Amer. 468* (BKL).

Hypnum (Hypnaceae)
cupressiforme Hedw. (T,C) - CAMDEN: *Long 2069* (PH); HUNTERDON: *Cantlon 224* (CHRB); PASSAIC: *MA 419* (NY).
var. *resupinatum* (Tayl.) Schimp. (N,D,**S1**) - NJ: *MA 420 & 422*(NY).
curvifolium Hedw. (T,B,**S1/2**) - BERGEN: *Austin*, 1865 (NY); BURLINGTON: *Robertson 4783* (PH); HUNTERDON: *Best*, 1894 (NY).
imponens Hedw. (T,A) - SNJ: *MA 418* (NY); CAPE MAY: *Robertson 4263* (PH); MIDDLESEX: *Cantlon*, 1950 (CHRB).
lindbergii Mitt. (T,A) - BURLINGTON: *Robertson 7694* (PH); MORRIS: *Moul 6142* (CHRB); SUSSEX: *Wiegmann 188* (NY).
pallescens (Hedw.) P. Beauv. (T,B,**S1/2**) - NNJ: *MA 414* (NY); CAMDEN: *Roberston 4935* (PH); HUNTERDON: *Best*, 1893 (NY).
pratense (Rabenh.) W. Koch (T,A) - NJ: *MA 425* (NY); BERGEN: *Austin*, 1871 (NY); SUSSEX: *Moul 7450* (CHRB).

Isopterygiopsis (Hypnaceae)
muelleriana (Schimp.) Iwats. (N,D,**S1**) - NJ: *MNC 425* (NY); BERGEN: *Austin*, 1872 (NY), *Austin*, 1869 (NY).
pulchella (Hedw.) Iwats. (N,D,**S1**) - NNJ: *MA 352* (NY), *MNC 424* (NY); MORRIS: *Austin*, 1867 (NY).

Isopterygium (Hypnaceae)
tenerum (Sw.) Mitt. (T,B) - BERGEN: *MA 429* (NY); MONMOUTH: *Cantlon & Moul*, 1949 (CHRB); SALEM: *Long 835a* (PH).

Leptobryum (Bryaceae)
pyriforme (Hedw.) Wils. (T,B,**S1/2**) - NJ: *MNC 206* (NY); HUNTERDON: *Best*, 1902 (NY); MONMOUTH: *Britton*, 1910 (NY).

Leptodictyum (Amblystegiaceae)
humile (P. Beauv.) Ochyra (T,B,**S1/2**) - BURLINGTON: *Robertson 6391* (PH); HUNTERDON: *Best*, 1898 (NY); SOMERSET: *Stephenson*, 1962 (CHRB).
riparium (Hedw.) Warnst. (T,A) - BERGEN: *MNC 456* (NY); HUNTERDON: *Best*, 1890 (NY); MORRIS: *Britton*, 1886 (CHRB).

Leskea (Leskeaceae)
gracilescens Hedw. (T,B) - CAPE MAY: *Long 669* (PH); HUNTERDON: *Best*, 1897 (NY); SOMERSET: *Moul 7545* (CHRB, NY).
obscura Hedw. (T,B) - BURLINGTON: *Robertson 4806* (PH); SUSSEX: *Wiegmann 167* (NY); WARREN: *Beals*, 1938 (NY).
polycarpa Hedw. (T,B) - CUMBERLAND: *Long 1432* (PH); HUNTERDON: *Cantlon 323* (CHRB); WARREN: *Schaeffer 161* (PH).

Leskeella (Leskeaceae)
nervosa* (Brid.) Loeske (T,B,S1**) - CUMBERLAND: *Long 1124* (PH); GLOUCESTER: *Long 2184* (PH); SOMERSET: *Wistendahl 23* (CHRB).

Leucobryum (Leucobryaceae)
albidum (Brid.) Lindb. (T,A) - ATLANTIC: *Zanoni*, 1970 (CHRB); BURLINGTON: *Koster B-10* (NY); SUSSEX: *Wallace 82-0028* (CHRB).
glaucum (Hedw.) Angstr. (T,A) - CAPE MAY: *Britton*, 1897 (NY); PASSAIC: *Moul 8846* (CHRB); SOMERSET: *Monk*, 1956 (CHRB).

Leucodon (Leucodontaceae)
brachypus Brid. (N,D,**S1**) - NJ: *MNC 316* (NY); BERGEN: *Austin*, 1864 (NY).
julaceus (Hedw.) Sull. (T,C) - BURLINGTON: *Beals*, 1938 (NY); HUNTERDON: *Best*, 1891 (NY); PASSAIC: *Tees 1116* (PH).

Limprichtia (Amblystegiaceae)

*_revolvens_ (Sw.) Loeske (N,A,S1) - WARREN: *Karlin 8711-0501* (Ramapo), *Karlin 8803-1813* (Ramapo).

Lindbergia (Leskeaceae)

brachyptera (Mitt.) Kindb. (N,D,S1) - HUNTERDON: *Best*, 1898 (NY); SUSSEX: *MA 268* (NY).

Loeskeobryum (Hylocomiaceae)

brevirostre (Brid.) Fleisch. (N,D,**S1/2**) - NJ: *MA 448* (NY); HUNTERDON: *Best*, 1895 (NY).

Meesia (Meesiaceae)

triquetra (Richt.) Angstr. (N,D,S1) - BERGEN: *MNC 249* (NY), *MA 217* (NY); *Austin*, 1866 (NY).

Micromitrium(Ephemeraceae)

austinii Sull. (T,B,S1) - BERGEN: *MNC 50* (NY); MONMOUTH: *Haynes*, 1911 (NY); SOMERSET: *BUELL s.n.* (CHRB).

megalosporum Aust. (T,D,S1) - BERGEN & CAMDEN: *MA 47* (NY), *MNC 52* (NY).

synoicum (James) Aust. (T,D,S1) - BERGEN: *MNC 51* (NY); CAMDEN: *James*, 1858 (NY); GLOUCESTER: *Kaiser*, 1914 (NY).

Mnium (Mniaceae)

ambiguum H. Müll. (T,A,**S1/2**) - NJ: *MA 208* (NY), *MNC 239* (NY); BERGEN: *Austin*, 1867 (NY); MORRIS: *Austin*, 1866 (NY).

hornum Hedw. (T,A) - HUDSON: *MA 211* (NY); MONMOUTH: *Britton*, 1910 (NY); SUSSEX: *Karlin 8809-0808* (Ramapo).

marginatum (With.) Brid. (T,C,**S1/2**) - BERGEN: *MA 210* (NY); SUSSEX: *Wiegmann 148* (NY); OCEAN: *Weikert*, 1941 (NY).

*_spinulosum_ Bruch & Schimp. (N,D,S1) - BERGEN: *MA 209* (NY), *Britton 188* (CHRB).

stellare Hedw. (T,A,**S1/2**) - BERGEN: *Austin*, 1873 (CHRB); BURLINGTON: *Long 1572* (PH); SUSSEX: *Karlin M9003-1009* (Ramapo).

Myurella (Pterigynandraceae)

*_julacea_ (Schwaegr.) Schimp. (N,D,S1) - WARREN: *MNC 324* (NY), *Austin*, 1871 (NY,PH).

sibirica (C. Müll.) Reim. (N,B,S1) - BERGEN: *MA 265* (NY), *MNC 323* (NY); WARREN: *Cowan & Wurdack 182* (NY).

Neckera (Neckeraceae)

pennata Hedw. (N,C,S1) - BERGEN: *Austin*, 1865 (NY); PASSAIC: *Robinson*, 1938 (NY); SUSSEX: *MNC 308* (NY).

Orthotrichum (Orthotrichaceae)

anomalum Hedw. (N,B,S1) - HUNTERDON: *Best*, 1893 (NY); SOMERSET: *Moul 6854* (CHRB).

obtusifolium Brid. (N,D,S1) - NJ: *MNC 186* (NY); SUSSEX: *Austin*, 1875 (NY).

ohioense Sull. & Lesq. (T,C,**S1/2**) - NJ: *MNC 191* (NY); GLOUCESTER: *Rau*, 1890 (NY); HUNTERDON: *Best*, 1894 (NY).

pumilum Sw. (T,C) - BERGEN: *Austin*, 1870 (NY); HUNTERDON: *Best*, 1893 (NY); SALEM: *Long 927a* (PH).

pusillum Mitt. (T,C,**S1/2**) - BURLINGTON: *Koster*, 1939 (NY); ESSEX: *Austin*, 1866 (NY); HUNTERDON: *Best*, 1893 (PH).

sordidum Sull. & Lesq. (T,C) - CAPE MAY: *Long 2011* (PH); ESSEX: *Austin*, 1867 (NY); HUNTERDON: *Best*, 1893 (NY).

*_speciosum_ Nees var. *elegans* (Schwaegr.) Warnst. (T,D,S1) - BERGEN: *MA 172* (NY); BURLINGTON: *James*, 1858 (NY).

stellatum Brid. (T,C,?) - BURLINGTON: *Koster*, 1940 (NY); CUMBERLAND: *Githens 1649* (PH); HUNTERDON: *Best*, 1893 (NY).

strangulatum P. Beauv. (N,B,?) - HUDSON: *Austin*, 1862 (NY); PASSAIC: *Austin*, 1867 (NY); HUNTERDON: *Cantlon 324* (PH).

Oxystegus (Pottiaceae)

tenuirostris (Hook. & Tayl.) A.J.E. Sm. (N,D,S1) - NNJ: *MA 114* (NY); MORRIS: *Austin*, 1867 (NY); WARREN: *Austin*, 1871 (NY).

Paraleucobryum (Dicranaceae)
longifolium (Hedw.) Loeske (N,D,S1) - NNJ: *MA 84* (NY).
Phascum (Pottiaceae)
cuspidatum Hedw. (T,C,S1) - NJ: *MA 53* (NY); BERGEN: *Austin*, 1864 (NY); MERCER: *Chamberlin 4592* (NY).
Philonotis (Bartramiaceae)
fontana (Hedw.) Brid. (N,A) - BERGEN: *Karlin 8809-0040* (Ramapo); HUNTERDON: *Moul 7822* (CHRB, NY); WARREN: *Austin*, 1871 (NY).
*var. *caespitosa* (Jur.) Schimp. (N,D,S1) - BERGEN: *MNC 265* (NY).
marchica (Hedw.) Brid. (N,D,S1) - BERGEN: *Austin*, 1867 (NY); PASSAIC: *Austin*, 1867 (NY).
**muehlenbergii* (Schwaegr.) Brid. (N,B,S1) - MIDDLESEX: *Moul 7851* (CHRB).
Physcomitrium (Funariaceae)
immersum Sull. (S,D,S1) - CAMDEN: *MA 179* (NY), *MNC 200* (NY), *Parker*, 1864 (NY).
pyriforme (Hedw.) Hampe (T,B) - BERGEN: *Austin*, 1861 (NY); MIDDLESEX: *Moul 7347* (CHRB); MONMOUTH: *Britton*, 1910 (NY).
Plagiomnium (Mniaceae)
ciliare (C. Müll.) T. Kop. (T,A,?) - CUMBERLAND: *Long 2134* (NY); HUNTERDON: *Tees 595* (PH); PASSAIC: *Britton*, 1882 (NY).
cuspidatum (Hedw.) T. Kop. (T,B) - GLOUCESTER: *Long 2180* (PH); MIDDLESEX: *Wiegmann 110* (NY); *Moul 6145* (CHRB).
ellipticum (Brid.) T. Kop. (T,A,?) - BERGEN: *Britton*, 1901 (NY); CUMBERLAND: *Long 1580* (PH); SUSSEX: *Wiegmann*, 1916 (NY).
medium (Bruch & Schimp.) T. Kop. (N,D,S1) - HUNTERDON: *Best*, 1891 (NY); PASSAIC: *MA 206* (NY).
rostratum (Schrad.) T. Kop. (N,B,**S1/2**) - BERGEN: *MA 207* (NY); HUNTERDON: *Best*, 1891 (NY).
Plagiopus (Bartramiaceae)
oederiana (Sw.) Crum & Anderson (N,D,S1) - NNJ: *MA 222* (NY), *MNC 258* (NY); HUNTERDON: *Best*, 1891 (NY).
Plagiothecium (Plagiotheciaceae)
cavifolium (Brid.) Iwats. (T,B) - BERGEN: *Austin(?) 1866* (NY); MIDDLESEX: *Moul 6715* (CHRB); SALEM: *Long 1775* (PH).
denticulatum (Hedw.) Schimp. (T,B) - BURLINGTON: *Robertson 4805* (PH); HUNTERDON: *Moul 6742* (CHRB); MIDDLESEX: *Wiegmann*, 1915 (BKL).
laetum Schimp. (N,D,S1) - NNJ: *MNC 433* (NY); BERGEN: *Austin*, 1866 (NY); SUSSEX: *Austin*, 1867 (NY).
latebricola Schimp. (N,C,S1) - BERGEN: *MA 353* (NY), *Austin*, 1874 (NY); UNION: *Wiegman 1917* (NY).
Platydictya (Hypnaceae)
confervoides (Brid.) Crum (N,C,S1) - NJ: *MNC 438* (NY); SUSSEX: *Austin*, 1867 (NY); WARREN: *Beals*, 1938 (BKL,NY).
minutissima (Sull. & Lesq.) Crum (N,D,S1) - BERGEN: *Austin*, 1872 (NY).
**subtilis* (Hedw.) Crum (N,C,S1) - HUBTERDON: *Cantlon*, 1949 (CHRB).
Platygyrium (Hypnaceae)
repens (Brid.) Schimp. (T,B) - BERGEN: *MNC 343* (NY); SALEM: *Long 1422* (PH); SUSSEX: *Webster*, 1968 (CHRB).
Platyhypnidium (Brachytheciaceae)
riparioides (Hedw.) Dix. (N,A,S1/2) - BERGEN: *Beals*, 1938 (NY), *Karlin 8803-3102* (Ramapo); SUSSEX: *Austin*, 1871 (NY).
Platylomella (Amblystegiaceae)
lescurii (Sull.) Andrews (N,C,S1) - NNJ: *MA 371* (NY); BERGEN: *Levy*, 1918 (NY); WARREN: *MNC 439* (NY).
Pleuridium (Ditrichaceae)
palustre (Bruch & Schimp.) Bruch & Schimp. (S,D,S1) - NJ: *MA 55* (NY), *MNC 64* (NY); BURLINGTON: *James*, 1854 (NY).
ravenelii Aust. (S,D,S1) - NJ: *MA 457* (NY); OCEAN: *Austin*, 1869 (NY).
subulatum (Hedw.) Rabenh. (T,B) - BERGEN: *Austin*, 1865 (NY); CAPE MAY: *Long 678*

(PH); HUNTERDON: *Best*, 1898 (NY).

sullivantii Aust. (N,D,S1) - MERCER: *Austin & Laning*, 1852 (NY).

Pleurozium (Hylocomiaceae)

schreberi (Brid.) Mitt. (T,A) - OCEAN: *Best*, 1889 (NY); SUSSEX: *Knight*, 1882 (NY); WARREN: *Karlin 9103-2620* (Ramapo).

Pogonatum (Polytrichaceae)

brachyphyllum (Michx.) P. Beauv. (S,B) - CAPE MAY: *Robertson 4255* (PH); OCEAN: *MA 234* (NY), *MNC 279* (NY).

pensilvanicum (Hedw.) P. Beauv. (T,A) - GLOUCESTER: *Gyer*, 1991 (Ramapo); SOMERSET: *Moul 7546* (NY); SUSSEX: *Kish & Steere*, 1973 (NY).

Pohlia (Bryaceae)

annotina (Hedw.) Lindb. (T,B,S1) - NJ: *MNC 210* (NY); BURLINGTON: *Robertson 5736* (PH); WARREN: *Rau* (NY).

cruda (Hedw.) Lindb. (N,C,S1) - NJ: *MA 187* (NY), *MNC 209* (NY); BERGEN: *Austin*, 1876 (BKL), *Britton*, 1876 (CHRB); HUNTERDON: *Cantlon*, 1949 (CHRB).

elongata Hedw. (T,B,S1) - SNJ: *Austin*, 1863 (BKL); SOMERSET: *Moul 7315* (CHRB).

lescuriana (Sull.) Grout (N,B,S1) - BERGEN: *MA 190* (NY,PH), *Austin* (CHRB); SUSSEX: *Wiegmann 146* (NY).

melanodon (Brid.) Shaw (N,D,S1) - BERGEN: *Austin*, 1867 (NY); WARREN: *Austin*, 1867 (NY).

nutans (Hedw.) Lindb. (T,B) - MIDDLESEX: *Moul 7944* (NY,CHRB); OCEAN: *Tees 1365* (PH); SUSSEX: *Wiegmann 140* (NY).

**proligera* (Breidl.) Arnell (N,B,S1) - BERGEN: *Austin*, 1878 (NY).

wahlenbergii (Web. & Mohr) Andrews (T,B) - BERGEN: *Beals 17 June 1917* (NY); BURLINGTON: *Robertson 4794* (PH); MONMOUTH: *Britton*, 1886 (CHRB).

Polytrichum (Polytrichaceae)

commune Hedw. (T,A) - CUMBERLAND: *Long 1049* (NY,PH); ESSEX: *Kish 193* (NY); SUSSEX: *Kish 171* (NY).

var. *perigoniale* (Michx.) Hampe (S,C,S1) - BURLINGTON: *Moul 2452* (PH).

juniperinum Hedw. (T,A) - HUNTERDON: *Best*, 1890 (NY); OCEAN: *Moul 2670* (CHRB); SUSSEX: *Tees 1132* (PH).

ohioense Ren. & Card. (T,A) - GLOUCESTER: *Long 2128* (NY); MORRIS: *Kish 212* (NY); PASSAIC: *Nash*, 1890 (NY).

pallidisetum Funck (N, ,S1) - SUSSEX: *Rogerson*, 1977 (DUKE).

piliferum Hedw. (T,A) - BERGEN: *MA 239* (NY); CUMBERLAND: *Long 2348* (PH); WARREN: *Webster*, 1968 (CHRB).

strictum Brid. (N,D,S1) - NJ: *MA 238* (NY), *MNC 285* (NY).

Pottia (Pottiaceae)

truncata (Hedw.) Fürnr. (N,B,S1/2) - BERGEN: *MNC 131* (NY), *Austin*, 1873 (NY); HUNTERDON: *Best*, 1890 (NY); SOMERSET: *Webster*, 1968 (CHRB).

Pseudobryum (Mniaceae)

cinclidioides (Hub.) T. Kop. (N,D,S1) - BERGEN: *MNC 245* (NY), *Austin*, 1869 (NY), *Britton 214* (CHRB).

Pseudotaxiphyllum (Hypnaceae)

distichaceum (Mitt.) Iwats. (N,D,S1) - PASSAIC: *Austin*, 1867 (NY); SUSSEX: *Austin*, 1866 (NY).

elegans (Brid.) Iwats. (T,A) - BERGEN: *MA 349* (NY), *Austin*, 1868 (NY); BURLINGTON: *Robertson 4129* (PH).

Pterigynandrum (Pterigynandraceae)

filiforme Hedw. (N,B,S1) - NNJ: *?*, 1961 (CHRB); BERGEN: *MA 280* (NY), *MNC 341* (NY).

Ptilium (Hypnaceae)

crista-castrensis (Hedw.) De Not. (N,D,S1) - BERGEN: *MA 434* (NY), *MNC 510* (NY).

Ptychomitrium (Ptychomitriaceae)

incurvum (Schwaegr.) Spruce (T,C,S1/2) - NNJ: *MA 153* (NY), *MNC 175* (NY); HUNTERDON: *Best*, 1891 (NY); MIDDLESEX: *Long 2966* (PH).

Pylaisiadelpha (Hypnaceae)

tenuirostris (Bruch & Schimp.) Buck (T,B,S1/2) - BERGEN: *Austin*, 1865 (NY);

MONMOUTH: *Beals*, 1933 (NY); SUSSEX: *Niering & Moul 7448* (CHRB).

Pylaisiella (Hypnaceae)

intricata (Hedw.) Grout (T,D,S1/2) - NJ: *MA 294* (NY); BERGEN: *Austin*, 1865 (NY); BURLINGTON: *Best*, 1892 (NY).

polyantha (Hedw.) Grout (T,C,S1) - ATLANTIC: *Long 1315* (PH); BERGEN: *MNC 357* (NY), *Austin*, 1867 (NY); CUMBERLAND: *Long 1802* (PH).

selwynii (Kindb.) Crum *et al.* (T,C,S1) - BERGEN: *Wiegmann 787* (NY); SUSSEX: *Nearing*, 1940 (NY); PASSAIC: *Tees 1099* (PH); SALEM: *Long 970* (PH).

Racomitrium (Grimmiaceae)

aciculare (Hedw.) Brid. (N,D,S1) - BERGEN: *MA 147* (NY), *MNC 168* (NY), *Austin*, 1867 (NY).

venustum Frisv. (N,D,S1) - NNJ: *MA 148-149* (NY); SOMERSET: *Moul 7302* (CHRB); SUSSEX: *Austin*, 1866 (NY).

Rauiella (Thuidiaceae)

scita (P. Beauv.) Reim. (N,D,S1) - NJ: *MA 301* (NY); BERGEN: *MA 300* (NY), *Jelliffe*, 1888 (BKL).

Rhabdoweisia (Dicranaceae)

crispata (With.) Lindb. (N,D,S1) - BERGEN: *MA 72* (NY), *MNC 80* (NY); WARREN: *MA 71* (NY), *Austin*, 1871 (NY).

Rhizomnium (Mniaceae)

appalachianum T. Kop. (N,A,S1) - BERGEN: *Austin*, 1867 (NY); PASSAIC: *Britton*, 1885 (NY); SUSSEX: *Karlin M9003-1003* (Ramapo).

**magnifolium* (Horik.) T. Kop. (T,B,S1) - CUMBERLAND: *Long 1040* (PH); PASSAIC: *Tees 1105* (PH); SUSSEX: *Moul & Johnson 7964* (CHRB,PH).

punctatum (Hedw.) T. Kop. (T,A) - ESSEX: *Wiegmann*, 1916 (NY); HUNTERDON: *Best 45* (NY); OCEAN: *Robertson 5785* (PH).

Rhodobryum (Bryaceae)

ontariense (Kindb.) Par. (N,A) - HUNTERDON: *Cantlon 283* (CHRB); SOMERSET: *Moul 7312* (CHRB); SUSSEX: *Moul 8575* (NY,PH).

Rhytidiadelphus (Hylocomiaceae)

triquetrus (Hedw.) Warnst. (T,D,S1/2) - NJ: *MA 449* (NY), *MNC 524* (NY); HUNTERDON: *Best*, 1890 (NY); MONMOUTH: *Small*, 1894 (NY).

Rhytidium (Rhytidiaceae)

rugosum (Hedw.) Kindb. (N,A,S1) - BERGEN: *MNC 526* (NY); SUSSEX: *Wallace 82-0027* (CHRB).

Saelania (Ditrichaceae)

**glaucescens* (Hedw.) Broth. (N,D,S1) - PASSAIC: *Porter*, 1867 (CHRB), *MNC 141* (NY).

Sanionia (Amblystegiaceae)

**uncinata* (Hedw.) Loeske (N,D,S1) - HUNTERDON: *Best*, 1892 & 1893 (NY).

Schistidium (Grimmiaceae)

agassizii Sull. & Lesq. (N,D,S1) - SUSSEX: *MNC 160* (NY).

apocarpum (Hedw.) Bruch. & Schimp. (T,B) - BERGEN: *Austin*, 1864 (NY); SALEM: *Long 2080* (PH); WARREN: *Webster*, 1968 (CHRB).

rivulare (Brid.) Podp. (N,D,S1) - NJ: *MNC 158* (NY); HUNTERDON: *Best*, 1891 (NY).

Schwetschkeopsis (Myiniaceae)

fabronia (Schwaegr.) Broth. (N,B,S1/2) - NJ: *MA 267* (NY); HUDSON: *Austin*, 1866 (NY); HUNTERDON: *Cantlon 237* (CHRB).

Scorpidium (Amblystegiaceae)

**scorpioides* (Hedw.) Limpr. (N,A,S1) - SUSSEX: *Karlin 9103-2607* (Ramapo); WARREN: *Wiegmann*, 1916 (BKL), *Robertson 4539* (PH).

Seligeria (Seligeriaceae)

donniana (Sm.) C. Müll. (N,D,S1) - SUSSEX: *Austin*, 1867 (NY), *Austin*, 1867 (NY).

recurvata (Hedw.) Bruch & Schimp. (N,D,S1) - BERGEN: *MA 110* (NY), *MNC 130* (NY), *Austin*, 1869 (NY).

Sematophyllum (Sematophyllaceae)

adnatum (Michx.) Britt. (N,B,S1/2) - BERGEN: *MA 339* (NY); HUNTERDON: *Cantlon & Moul 335* (CHRB); SUSSEX: *Russak & Moul 7454* (CHRB,PH).

demissum (Wils.) Mitt. (N,B,S1) - BERGEN: *MA 338* (NY); HUNTERDON: *Best*, 1892

(NY); SUSSEX: *Moul & Niering 7445* (CHRB).

marylandicum (C. Müll.) Britt. (N,D,S1) - WARREN: *MNC 409* (NY).

Sphagnum (Sphagnaceae)

affine Ren. & Card. (T,A) - BURLINGTON: *Andrus 5838* (BING); MORRIS: *Karlin 705* (BING).

angermanicum Melin (S,A) - CAPE MAY: *Andrus & Karlin 6995* (BING); OCEAN: *Maass*, 1966 (NY).

angustifolium (Russ.) C. Jens. (N,A,S1) - SUSSEX: *Karlin 231* (BING); WARREN: *Karlin 1236* (BING).

austinii Sull. ex Aust. (S,D,S1) - GLOUCESTER: *Rau*, 1882 (NY); OCEAN: *MA 2* (NY,PH,US).

bartlettianum Warnst. (T,A) - BURLINGTON: *Andrus 5835* (BING); WARREN: *Karlin 821* (BING).

capillifolium (Ehrh.) Hedw. (N,A,S1/2) - SUSSEX: *Karlin 230* (BING); WARREN: *Karlin 1255* (BING).

carolinianum Andrus (S,A,S1/2) - BURLINGTON: *Andrus 5842* (BING), *Andrus 6772* (BING).

centrale C. Jens. (N,A, S1) - SUSSEX: *Karlin 650* (BING), *Karlin 1188* (BING).

compactum DC. (T,A) - BURLINGTON: *Reed 9656* (US); PASSAIC: *Karlin 881* (Ramapo).

contortum Schultz (N,A,S1) - BERGEN: *MA 16* (UMASS); MORRIS: *Karlin 697* (BING).

cuspidatum Hoffm. (T,A) - ATLANTIC: *Koster 584* (NY); BERGEN: *Karlin 1409* (Ramapo).

cyclophyllum Sull. & Lesq. (S,A) - BURLINGTON: *Evans 211* (NY); OCEAN: *Karlin 1341* (Ramapo).

fallax (Klinggr.) Klinggr. (T,A) - BURLINGTON: *Andrus 5874* (BING); SUSSEX: *Karlin & Andrus 564* (Ramapo).

fimbriatum Wils. (T,A) - BURLINGTON: *Reed 77575-A* (REED); SUSSEX: *Karlin 646* (BING);

flavicomans (Card.) Warnst. (T,A) - OCEAN: *MA 18* (NY); SUSSEX: *Karlin & Andrus 568* (Ramapo).

flexuosum Dozy & Molk. (T,A, S1/2) - SUSSEX: *Karlin & Andrus 563* (Ramapo); WARREN: *Karlin 824* (BING).

fuscum (Schimp.) Klinggr. (T,A,S1/2) - MONMOUTH: *Gordon*, 1988 (BING); SUSSEX: *Karlin 19* (BING).

girgensohnii Russ. (N,A) - SUSSEX: *Karlin 643* (BING); WARREN: *Karlin 842* (Ramapo).

henryense Warnst. (T,A) - CUMBERLAND: *Andrus 5893* (BING); SUSSEX: *Karlin 721* (BING).

lescurii Sull. (T,A) - BURLINGTON: *Andrus 6780* (BING); WARREN: *Karlin 803* (BING).

macrophyllum Brid. (S,A,S1/2) - CAPE MAY: *Andrus & Karlin 7009* (BING); OCEAN: *Andrus 5875* (BING).

var. *floridanum* Aust. (S,B,S1) - ATLANTIC: *Robertson 7072* (PH); CAPE MAY: *Robertson 7053* (BING).

magellanicum Brid. (T,A) - BURLINGTON: *Andrus 5825* (BING); WARREN: *Karlin 863* (BING).

molle Sull. (S,A) - BURLINGTON: *Andrus 6775* (BING); OCEAN: *Karlin 1210* (Ramapo).

palustre L. (T,A) - OCEAN: *Smith 2640* (NY); WARREN: *Karlin 1229* (Ramapo).

papillosum Lindb. (T,A) - BURLINGTON: *Andrus 6621* (BING); SUSSEX: *Karlin 8207-2305* (Ramapo).

perichaetiale Hampe (S,A) - ATLANTIC: *List 1107* (BING); BURLINGTON: *Robertson 7084* (BING,PH).

platyphyllum (Braithw.) Warnst. (N,A,S1) - BERGEN: *Austin 757* (NY), *Karlin 8809-0001* (BING).

portoricense Hampe (S,A) - BURLINGTON: *Robertson 8283* (BING); CAPE MAY: *Andrus & Karlin 6983* (BING).

pulchrum (Braithw.) Warnst. (T,A) - BURLINGTON: *Andrus 6623* (BING); SUSSEX:

Karlin & Andrus 570 (Ramapo).
pylaesii Brid. (T,A) - BURLINGTON: *Andrus 6629* (BING); SUSSEX: *Karlin 403* (BING).
recurvum P. Beauv. (T,A) - BURLINGTON: *Andrus 5830* (BING); SUSSEX: *Karlin 8207-2307* (Ramapo).
riparium Angstr. (N,A,S1) - PASSAIC: *Karlin 1504* (BING); SUSSEX: *Andrus & Karlin 6836* (BING).
rubellum Wils. (T,A) - OCEAN: *Andrus 3600* (BING); SUSSEX: *Karlin 8304-2205* (Ramapo).
russowii Warnst. (N,A, S1/2) - SUSSEX: *Karlin 645* (BING); WARREN: *Karlin 846* (BING).
squarrosum Crome (T,A,S1/2) - PASSAIC: *Karlin 311* (BING); WARREN: *Karlin 832* (BING).
strictum Sull. (S,A,S1) - ATLANTIC: *Koster S144* (NY); BURLINGTON: *List 1112* (BING).
subsecundum Nees (N,A,S1) - BERGEN: *Austin 709* (NY); SUSSEX: *Andrus & Karlin 6818* (BING).
subtile (Russ.) Warnst. (N,A,S1) - MORRIS: *Karlin 699* (BING); SUSSEX: *Andrus & Karlin 6814* (BING).
tenellum (Brid.) Bory. (S,A,S1/2) - ATLANTIC: *Koster 24* (NY); OCEAN: *Austin 810* (NY).
tenerum Sull. & Lesq. (T,A) - BERGEN: *Austin 803* (NY); BURLINGTON: *Andrus 5831* (BING).
teres (Schimp.) Angstr. (N,A,S1/2) - BERGEN: *Austin 755* (NY); SUSSEX: *Karlin 1259* (Ramapo).
torreyanum Sull. (T,A) - BERGEN: *MA 34* (NY); CAPE MAY: *Karlin & Andrus 896* (BING).
trinitense C. Müll. (S,A) - ATLANTIC: *Karlin & Andrus 954* (Ramapo); BURLINGTON: *Andrus 6619* (BING).
warnstorfii Russ. (N,A,S1/2) - SUSSEX: *Karlin & Breden 1180* (BING); WARREN: *Robertson 5655* (BING,PH).

Splachnum (Splachnaceae)
ampullaceum Hedw. (S,D,S1) - BURLINGTON: *Tatnall s.n.* (PH).
pennsylvanicum (Brid.) Grout (S,D,S1) - SNJ: *MA 177* (BKL), *MNC 198* (NY); BURLINGTON: *Austin*, 1868 (BKL).

Steerecleus (Brachytheciaceae)
serrulatus (Hedw.) Robins. (T,B) - CAPE MAY: *Long 2021* (PH); HUDSON: *Austin*, 1867 (NY); HUNTERDON: *Best*, 1894 (NY).

Taxiphyllum (Hypnaceae)
deplanatum (Bruch & Schimp.) Fleisch. (T,B,S1/2) - BERGEN: *MA 344* (NY); MONMOUTH: *Tees 733* (PH); SUSSEX: *Wiegmann*, 1915 (NY).
taxirameum (Mitt.) Fleisch. (T,C,S1) - CUMBERLAND: *Long 607* (PH); HUDSON: *Austin*, 1867 (NY); HUNTERDON: *Best*, 1906 (NY).

Tetraphis (Tetraphidaceae)
pellucida Hedw. (T,A) - ATLANTIC: *Forman B123* (PH); MIDDLESEX: *Moul 6994* (NY,CHRB); SUSSEX: *Karlin 9012-2301* (Ramapo).

Tetraplodon (Splachnaceae)
**angustatus* (Hedw.) Bruch & Schimp. (S,D,S1) - BURLINGTON: *Greene 18431* (NY), *Greene 481* (NY).

Thamnobryum (Thamnobryaceae)
alleghaniense (C. Müll.) Nieuwl. (N,B) - BERGEN: *MA 337* (NY); ESSEX: *Wiegmann 756* (NY); HUNTERDON: *Moul 6811* (CHRB).

Thelia (Theliaceae)
asprella Sull. (T,B) - HUNTERDON: *Moul 6243* (NY); SALEM: *Long 2093* (PH); SUSSEX: *Buell & Niering*, 1950 (CHRB).
hirtella (Hedw.) Sull. (T,B) - ESSEX: *Wiegmann 991* (NY); MIDDLESEX: *Webster*, 1968 (CHRB); OCEAN: *Long 2354* (PH).
lescurii Sull. (T,B) - BERGEN: *MNC 322* (NY); BURLINGTON: *Beals*, 1938 (NY); CAMDEN: *Long 1960* (PH).

Thuidium (Thuidiaceae)
- *delicatulum* (Hedw.) Schimp. (T,A) - BERGEN: *Wiegmann*, 1920 (NY); CAPE MAY: *Moul 6162* (CHRB,NY); WARREN: *Schaeffer 176* (PH).
- *philibertii* Limpr. (N,D,S1) - HUNTERDON: *Best*, 1893 (NY), *Best*, 1896 (NY).
- *recognitum* (Hedw.) Lindb. (T,B,S1/2) - GLOUCESTER: *Lippincott*, 1898 (PH); HUNTERDON: *Moul & Buell*, 1956 (CHRB); WARREN: *Beals*, 1938 (NY).

Timmia (Timmiaceae)
- *megapolitana* Hedw. (N,C,S1) - HUNTERDON: *Best*, 1891 (NY); SOMERSET: *Austin*, 1867 (NY); SUSSEX: *Wiegmann 114* (NY).

Tomenthypnum (Brachytheciaceae)
- *nitens* (Hedw.) Loeske (N,A,S1/2) - SUSSEX: *MA 307* (NY), *Karlin 8709-2806* (Ramapo); WARREN: *Robertson 4530* (PH), *Karlin 9103-2602* (Ramapo).

Tortella (Pottiaceae)
- *fragilis* (Hook. & Wils.) Limpr. (N,D,S1) - SUSSEX: *MA 129* (NY), *MNC 150* (NY).
- *humilis* (Hedw.) Jenn. (T,B) - BERGEN: *Torrey*, 1820 (NY); OCEAN: *Britton*, 1883 (NY); SOMERSET: *Moul 6714* (CHRB).
- *tortuosa* (Hedw.) Limpr. (N,C,S1) - BERGEN: *Austin*, 1867 (NY); SUSSEX: *Best*, 1907 (NY), *Austin*, 1867 (NY).

Tortula (Pottiaceae)
- *muralis* Hedw. (T,B,S1/2) - BERGEN: *MA 130* (NY); BURLINGTON: *Robertson 4785* (PH); PASSAIC: *Nash 122* (NY); SOMERSET: *Webster*, 1968 (CHRB).
- *pagorum* (Milde) De Not. (N,D,S1) - SUSSEX: *Austin*, 1867 (NY).
- *papillosa* Wils. (T,B,S1) - NJ: *MA 133* (NY), *James*, 1851 (NY); BURLINGTON: *James* s.n. (CHRB,PH); HUDSON: *Austin, s.n.* (NY).
- **ruralis* (Hedw.) Gaertn. *et al.* (N,D,S1) - BERGEN & SUSSEX: *MA 132* (NY), *MNC 152* (NY); PASSAIC: *Burnett*, 1890 (NY).

Trematodon (Bruchiaceae)
- **ambiguus* (Hedw.) Hornsch. (N,D,S1) - BERGEN: *MNC 82* (NY), *Austin*, 1874 (BKL,NY); PASSAIC: *Beals*, 1917 (BKL).
- *longicollis* Michx. (T,B,S1) - BERGEN: *MA 476* (NY), *MNC 81* (NY); BURLINGTON: *Robertson 4034* (PH); OCEAN: *Britton*, 1887 (BKL,NY).

Ulota (Orthotrichaceae)
- *coarctata* (P.Beauv.) Hammar (T,D,S1) - NNJ: *MNC 180* (NY); BERGEN: *Austin*, 1866 (NY); GLOUCESTER: *Ellis*, 1893 (NY); PASSAIC: *Fisher 1893* (PH).
- *crispa* (Hedw.) Brid. (T,B) - NJ: *MNC 182* (NY); BERGEN: *Austin*, 1865 (NY); HUNTERDON: *Best*, 1893 (NY); OCEAN: *Britton & Britton*, 1889 (NY);
- *hutchinsiae* (Sm.) Hammar (N,B,S1) - NJ: *MNC 181* (NY); BERGEN: *Wiegmann*, 1915 (BKL); SUSSEX: *Moul 7438* (CHRB,PH).

Warnstorfia (Amblystegiaceae)
- *exannulata* (Schimp.) Loeske (T,A) - SNJ: *Austin*, 1863 (NY); BERGEN: *Karlin 8804-2101* (NY); MORRIS: *MA 408* (NY).
- *fluitans* (Hedw.) Loeske (T,A) - HUNTERDON: *Best*, 1892 (NY); PASSAIC: *Karlin 8705-2201* (NY); SUSSEX: *Austin*, 1866 (NY);

Weissia (Pottiaceae)
- *controversa* Hedw. (T,B) - CUMBERLAND: *Long 1621* (PH); HUNTERDON: *Cantlon 329* (CHRB); PASSAIC: *MA 68* (NY); WARREN: *Rau*, 1882 (NY).
- *hedwigii* Crum (N,D,S1) - BERGEN: *MA 63* (NY), *MNC 72* (NY).

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Literature Cited

Anderson, L.E. 1990. A checklist of *Sphagnum* in North America north of Mexico. The Bryologist 93(4): 550-501.

_____, H.A. Crum & W.R. Buck. 1990. List of the Mosses of North America north of Mexico. The Bryologist 93: 448-499.

Andrus, R.E. & E.F. Karkin. 1989. A preliminary report on New Jersey's rare and endangered species of *Sphagnum*: A first look at endangered and threatened bryophytes in New Jersey, pp. 23-57. *In* Karlin, E.F. (ed.), New Jersey's Rare and Endangered Plants and Animals, Inst. for Env. Stud., Ramapo College, Mahwah, New Jersey. 280 pp.

Austin, C.F. 1863. Observations on the *Sphagnum* of New Jersey, with description of a new species. Am. Jour. Sci. II 35: 252-255.

_____. 1870. Musci Appalachiani, Exsiccatae. Closter, New Jersey.

_____. 1874. On some new North American Musci. Bull. Torrey Bot. Club 5: 21-24.

_____. 1876. On two new Musci. Bull. Torrey Bot. Club 6: 73-75.

_____. 1877. New mosses. Bull. Torrey Bot. Club 6: 142-145.

_____. 1879. Some new musci. Botanical Gazette 4: 161-163.

Andrews, A.L. 1912. Notes on North American *Sphagnum*. IV. The Bryologist 15: 70-74.

_____. 1915. Notes on North American *Sphagnum*. VI. The Bryologist 18: 1-6.

Bard, G.E. 1965. Terrestrial bryophytes in secondary succession in the Piedmont of New Jersey. The Bryologist 68: 201-208.

Biel, E.R. 1958. The climate of New Jersey, pp. 53-98. *In* The Economy of New Jersey. Rutgers Univeristy Press, New Brunswick, New Jersey.

Boerner, R.E. & R.T.T. Forman. 1975. Salt spray and coastal dune mosses. The Bryologist 78: 57-63.

Breden, T. 1989. The Natural Heritage database - A central clearinghouse for endangered species information. *In* E.F. Karlin (ed.), New Jersey's rare and endangered plants and animals, Inst. for Env. Studies, Ramapo College, Mahwah, New Jersey. 280 pp.

Britton, E.G. 1910. Coe Finch Austin, 1831-1880. The Bryologist 13: 1-4.

Britton, N.L. 1881. A preliminary catalogue of the flora of New Jersey. Ann. Rep. State Geol., New Brunswick, New Jersey. 233 pp.

_____. 1889. Catalogue of plants found in New Jersey. N.J. Geol. Surv., Final Rep. State Geol., No. 2, 619 pp.

Buell, M.F. & J.E. Cantlon. 1953. Effects of prescribed burning on ground cover in the New Jersey pine region. Ecology 34: 520-528.

Cantlon, J.E. 1953. Vegetation and microclimate on north and south slopes on Cushetunk Mountain, New Jersey. Ecological Monographs 23: 241-270.

Crum, H.A. & L.E. Anderson. 1981. Mosses of Eastern North America. 2 vols. Columbia Univ. Press, New York, NY. 1328 pp.

Dunlop, D.V. 1974. The climate of New Jersey. *In* Climate of the states. I. Eastern states. National Oceanic and Atmospheric Administration, U.S. Dept. Commerce, Water Info. Center, Inc., Port Washington, New York. 480 pp.

Forman, R.T.T. 1964. Growth under controlled conditions to explain the hierarchical distributions of a moss, *Tetraphis pellucida*. Ecol. Monogr. 34: 1-25.

_____. 1979a. Common bryophytes and lichens of the New Jersey Pine Barrens, pp. 407-424. *In* Forman, R.T.T. (ed.), Pine Barrens: Ecosystem and Landscape. Academic Press, New York. 601 pp.

_____. (ed.) 1979b. Pine Barrens: Ecosystem and landscape. Academic Press, New York. 601 pp.

Hamilton, E.S. 1953. Bryophyte life forms on slopes of contrasting exposure in central New Jersey. Bull. Torrey Bot. Club 80: 264-272.

Harshberger, J.W. 1916. The vegetation of the New Jersey Pine-Barrens. Christopher Sower Co., Philadelphia, PA. Reprinted in 1970 by Dover Publications, NY.

Karlin, E.F. 1990. Endangered bryophytes in New Jersey: determination, protection and management, pp. 208-210. *In* Mitchell, R.S., C.J. Sheviak & D.J.

Leopold (eds.), Ecosystem Management: Rare Species and Significant Habitats. Proc. 15th Ann. Natural Areas Conference. New York State Mus. Bull. 471. 314 pp.

_____. 1992. Mosses of the New Jersey Pine Barrens and adjacent Coastal Plain. Bartonia 58: (in press).

_____ & R.E. Andrus. 1986. *Sphagnum* vegetation of the low shrub bogs of northern New Jersey and adjacent New York. Bull. Torrey Bot. Club 113: 281-287.

_____ & R.E. Andrus. 1988. The *Sphagnum* species of New Jersey. Bull. Torrey Bot. Club 115: 168-195.

_____, R.E. Andrus & C.F. Reed. 1991. The *Sphagnum* flora of Delaware. Bull. Torrey Bot. Club 118: 43-51.

Kummel, H.B. 1940. The geology of New Jersey. New Jersey Dept. of Conservation and Development. Geologic Series Bulletin 50.

Lawton, E. 1951. Bryophytes of the Beaver Lake region of New Jersey - a new station for *Pohlia carnea* (L.) Lindb. Torreya 78: 164.

Little, S. 1951. Observations on the minor vegetation of the pine barren swamps in southern New Jersey. Bull. Torrey Bot. Club 78: 153-160.

McCormick, J. 1955. A vegetation of two watersheds in the New Jersey Pine Barrens. Ph.D. Thesis, Rutgers University, New Brunswick, New Jersey.

Moul, E.T. & M.F. Buell. 1955. Moss cover and rainfall interception in frequently burned sites in the New Jersey pine barrens. Bull. Torrey Bot. Club 82: 155-162.

Olsson, H. 1979. Vegetation of the New Jersey Pine Barrens: A phytosociological classification. *In* R.T.T. Forman (ed.), Pine Barrens: Ecosystem and landscape. Academic Press, New York. 601 pp.

Reed, C.F. 1986. Floras of the serpentine formations in eastern North America. Contributions of Reed Herbarium No. XXX, Baltimore, Maryland. 858 pp.

Robichaud, B. & M.F. Buell. 1973. Vegetation of New Jersey. Rutgers University Press, New Brunswick, New Jersey. 340 pp.

Tedrow, J.C. 1986. Soils of New Jersey. Krieger, Melbourne, FL. 512 pp.

Widmer, K. 1964. The geology and geography of New Jersey. Van Nostrand Co., Princeton, New Jersey.

Wistendahl, W.A. 1955. The flood plain of the Raritan River, New Jersey. Ph.D. Thesis, Rutgers University, New Brunswick, New Jersey. 115 pp.

Rode Lijst van Mossen en Korstmossen. Siebel, H. N., A. Aptroot, G. M. Dirkse, H. F. van Dobben, H. M. H. van Melick & A. Touw, 20 pages, 1992. Reprint of: Rode Lijst van in Nederland verdwenen en bedreigde mossen en Korstmossen. *Gorteria* 18: 1-20. 1992. The Dutch Bryological and Lichenological Society has produced a Red Book of extinct, endangered and vulnerable mosses and lichens in the Netherlands. The publication, in Dutch with an English summary, lists over half of the bryophyte and lichen floras as threatened (274 bryophytes and 367 lichens). The booklet can be ordered from: *B.F. van Tooren, Treasurer, Venuslaan 2, 3721 VG Bilthoven, The Netherlands*. for 7.50 Guilders including postage (giro account 2753451 "treasurer bryologische werkgroep KNNV in Bilthoven").

The 7th Annual Bloomquist Bryological Foray will be held in northwest Alabama from 25-27 Sept. 1992. The bryophytes are extremely rich in the deep, moist sandstone ravines that occur in this part of the state. For information contact: Dr. *Stephen L. Timme, Sperry Herbarium, Dept. of Biology, Pittsburg State University, Pittsburg, Kansas 66762* (Phone (316) 235-4740; FAX (316) 232-2430).

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New Hampshire Mosses

Bruce Allen [1]

New Hampshire, an original state of the Union, is a New England state bounded by Quebec (north), Maine (east), the Atlantic Ocean (extreme southeast), Massachusetts (south), and Vermont (west). There are three distinct land forms in the state. To the north is an area of continuous and extensive mountains (White Mountains) that includes a noteworthy cluster of twelve large - by eastern North American standards - peaks (4052-6288 ft). The central and most of the southern part of the state is a maturely dissected plateau dotted with Monadnocks (residual hills or mountains surrounded by peneplain). In the southeastern corner of the state there is a relatively low, narrow coastal border.

Due to its northern locality and high mountains the state's moss flora has a number of rare elements and a few far northern species that occur at or near the southern limit of their range. Mosses have been collected in New Hampshire by a number of notable bryologists since the mid-nineteenth century. Given these circumstances one would expect the moss flora of New Hampshire to be well documented, but the literature on New Hampshire mosses is meagre. The following list documents the county distribution of mosses based upon either a literature report(s) or a specimen(s) examined by me. Collections that can not be assigned to a county are included along with general locality data when they represent the only report of a species from the state. The list contains 222 taxa: probably less than two-thirds of the actual moss flora. Many of the historical New Hampshire moss collections will likely be found in the herbaria at DUKE, FH, NEBC, NHA, HNH, and NY. Examination of this material would markedly expand this list.

In the list species reported from the literature are referenced by a number(s) that refers to the corresponding number(s) in the Bibliography section. Species verified by examination are referenced by collector and collection number (when available). Some species were verified from several localities within a county, but only a single collection is referenced. Species both reported in the literature and verified by examination are referenced only by the examined collection. Except where otherwise noted, specimens examined are deposited in the herbarium of the Missouri Botanical Garden (MO). The nomenclature and systematic generic arrangment follows the recent *List of the mosses of North America North of Mexico* (Anderson, Crum & Buck, Bryologist 93: 448-499).

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[1] Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299.

AMBLYSTEGIACEAE

Calliergon cordifolium (Hedw.) Kindb. - Grafton (*Hutchinson*); Merrimack (*Allen 10042*).

stramineum (Brid.) Kindb. - Coos (12).

Campylium chrysophyllum (Brid.) J. Lange - Coos (Reliquiae Farlowianae *584*); Grafton (*sin. coll.*)

hispidulum (Brid.) Mitt. - Carroll (Reliquiae Farlowianae *589*); Coos (12).

stellatum (Hedw.) C. Jens. - Grafton (22).

Cratoneuron filicinum (Hedw.) Spruce - Coos (*Harper & Harper*).

Drepanocladus aduncus (Hedw.) Warnst. - Carroll (*James*).

aduncus var. kneiffii (Schimp. in B.S.G.) Mönk. - Grafton (33).

Hygroamblystegium tenax (Hedw.) Jenn. - Merrimack (*Allen 10047*).

Hygrohypnum duriusculum (De Not.) Jamieson - Belknap (19); Coos (19); Grafton (19).

eugyrium (Schimp. in B.S.G.) Loeske - Cheshire (19); Grafton (*Cummings*); Merrimack (*Allen 10033*).

luridum (Hedw.) Jenn. - Belknap (19); Grafton (9).

molle (Hedw.) Loeske - Belknap (*Stevens*); Coos (12); Grafton (22).

montanum (Lindb.) Broth. - Cheshire (Reliquiae Farlowianae *586*); Coos (Grout, N.A.M. Pleur. *397*).

ochraceum (Turn. ex Wils.) Loeske - Belknap (19); Cheshire (19); Coos (12, 19).

subeugyrium (Ren. & Card.) Broth. - White Mountains (19).

Leptodictyum riparium (Hedw.) Warnst. - Cheshire (*Ladd 7337*); Grafton (29).

Limprichtia revolvens (Sw.) Loeske - Grafton (22).

Platylomella lescurii (Sull. in Gray) Andrews - Carroll (Reliquiae Farlowianae *576*); Coos (25); Merrimack (*Allen 10039*).

Sanionia uncinata (Hedw.) Loeske - Carroll (33); Coos (Reliquiae Farlowianae *594*); Grafton (*Hutchinson*); Sullivan (*Butler*).

Scorpidium scorpioides (Hedw.) Limpr. - Grafton (22).

Warnstorfia exannulata (Schimp. in B.S.G.) Loeske - Carroll (33, as var. *rotae*); Coos (*Wickes*).

fluitans (Hedw.) Loeske - Coos (*Wickes*); Grafton (33); Merrimack (*Allen 10053*); Sullivan (*Butler*).

ANDREAEACEAE

Andreaea crassinervia Bruch - Carroll (*Lowe*, MAINE).

rothii Web. & Mohr - Cheshire (13); Grafton (*Allen 1431*).

rupestris Hedw. - Belknap (*Stevens*, MAINE); Cheshire (13); Coos (*Allen 171*); Grafton (*Allen 1432*).

ANOMODONTACEAE

Anomodon rostratus (Hedw.) Schimp. - Carroll (Reliquiae Farlowianae *577*).

rugelii (C. Müll.) Keissl. - Coos (*von Schrenk*); Grafton (*Faxon*).

Haplohymenium triste (Ces. in De Not.) Kindb. - Carroll (Reliquiae Farlowianae *595*); Grafton (10).

AULACOMNIACEAE

Aulacomnium androgynum (Lindb. & Arnell) Kindb. - Coos (6).

palustre (Hedw.) Schwaegr. - Coos (12).

turgidum (Wahlenb.) Schwaegr. - Coos (Holzinger, M.Acro.Bor.-Amer. *325*).

BARTRAMIACEAE

Bartramia pomiformis Hedw. - Coos (6); Grafton (9).

Conostomum tetragonum (Hedw.) Lindb. - Coos (Holzinger, M.Acro.Bor.-Amer. *456*).

Philonotis fontana (Hedw.) Brid. - Coos (*von Schrenk*); Grafton (9, 34).

fontana var. caespitosa (Jur.) Schimp. - Coos (6).

BRACHYTHECIACEAE

Brachythecium acuminatum (Hedw.) Aust. - Grafton (9); Merrimack (*Allen 10050*).

campestre (C. Müll.) Schimp. in B.S.G. - Grafton (Grout, N.A.M. Pleur. *7*).

oxycladon (Brid.) Jaeg. - Coos (12).

plumosum (Hedw.) Schimp. in B.S.G. - Coos (Reliquiae Farlowianae *578*); Grafton (Grout, N.A.M. Pleur. *10*); Merrimack (*Allen 10043*).

populeum (Hedw.) Schimp. in B.S.G. - Carroll (*Cummings*).

reflexum (Stark.) Schimp. in B.S.G. - Carroll (*James*); Coos (12).

rivulare (Schimp.) in B.S.G. - Grafton (Grout, N.A.M. Pleur. *9*); Merrimack (*Allen 10036*).

rutabulum (Hedw.) Schimp. in B.S.G. - Coos (*James*).

velutinum (Hedw.) Schimp. in B.S.G. - Merrimack (*Allen 10058*).

Eurhynchium pulchellum (Hedw.) Jenn. - Grafton (*sin. coll.*)

Isothecium myosuroides Brid. - Carroll (11).

Platyhypnidium riparioides (Hedw.) Dix. - Merrimack (*Allen 10032*).

BRUCHIACEAE

Bruchia vogesiaca Nestl. ex Schwaegr. - Carroll (27).

Trematodon ambiguus (Hedw.) Hornsch. - Carroll (*James*); Coos (*Cummings 1278*); Grafton (Grout, Hand-lens Mosses *34*).

BRYACEAE

Bryum algovicum Sendtn. ex C. Müll. - Grafton (*Mathias 179*).

argenteum Hedw. - Coos (2); Grafton (23).

caespiticium Hedw. - Grafton (*Cummings*).

capillare Hedw. - Grafton (*Hutchinson*).

pseudotriquetrum (Hedw.) Gaertn. et al. - Grafton (23).

Leptobryum pyriforme (Hedw.) Wils. - Grafton (*Cummings*).

Pohlia andalusica (Höhn.) Broth. - Coos (6, 28).

annotina (Hedw.) Lindb. - Coos (6, 28); Grafton (*Hutchinson*).

bulbifera (Warnst.) Warnst. - Coos (6, 28); Grafton (*Hutchinson*).

cruda (Hedw.) Lindb. - Grafton (9).

drummondii (C. Müll.) Andrews - Coos (12, 28).

elongata Hedw. - Grafton (22).

lescuriana (Sull.) Grout - Grafton (10).

nutans (Hedw.) Lindb. - Coos (*Greenman 2752*); Grafton (*Mathias 178*).

Rhodobryum ontariense (Hedw.) Limpr. - Cheshire (*Ladd 7342*); Grafton (22).

BUXBAUMIACEAE

Buxbaumia aphylla Hedw. - Grafton (*Cummings*); Merrimack (*Allen 10044*).

Diphyscium foliosum (Hedw.) Mohr - Sullivan (*Butler*); Grafton (*Anderson*).

CLIMACIACEAE

Climacium dendroides (Hedw.) Web. & Mohr - Cheshire (*Seymour 2511*); Sullivan (*Butler*).

DICRANACEAE

Arctoa fulvella (Dicks.) Bruch & Schimp. in B.S.G. - Coos (Grout, N.A.M. Perf. *355*).

Cynodontium strumiferum (Hedw.) Lindb. - Cheshire (13).

tenellum (Bruch & Schimp. in B.S.G.) Limpr. - Coos (Grout, N.A.M. Perf. *377*).

Dicranella cerviculata (Hedw.) Schimp. - Coos (*James*).

heteromalla (Hedw.) Schimp. - Cheshire (*Inoue 17949*); Coos (*Allen 1435*); Grafton (*Cummings*); Sullivan (*Butler*).

rufescens (With.) Schimp. - Coos (6).

subulata (Hedw.) Schimp. - Carroll (Holzinger, M.Acro.Bor.-Amer. *305*); Coos (*James*).

Dicranodontium denudatum (Brid.) Britt. in Williams - Grafton (22).

Dicranum acutifolium (Lindb. & Arnell) C. Jens. ex Weinm. - Coos (*James*).

bonjeani De Not. in Lisa - Coos (12).

elongatum Schleich ex Schwaegr. - Coos (*James*).

flagellare Hedw. - Carroll (*Grover*).

fulvum Hook. - Grafton (29); Merrimack (*Allen 10049*).

fuscescens Turn. - Coos (12); Grafton (*Anderson*).

montanum Hedw. - Grafton (29); Merrimack (*Allen 10048*).

ontariense Peters. - Coos (Reliquiae Farlowianae *557*).

polysetum Sw. - Carroll (*Bartlett 589*); Coos (Reliquiae Farlowianae *559*); Grafton (*Chandler*).

scoparium Hedw. - Carroll (*Grover*); Coos (Reliquiae Farlowianae *556*); Cheshire (*Clark*); Grafton (*Anderson*); Hillsborough (*Smith*).

viride (Sull. & Lesq. in Sull.) Lindb. - Grafton (10).

Kiaeria blyttii (Schimp.) Broth. - Coos (12).

starkei (Web. & Mohr) Hag. - Coos (Grout, N.A.M. Perf. *352*).

Oncophorus wahlenbergii Brid. - Coos (*James*); Grafton (10).

Paraleucobryum longifolium (Hedw.) Loeske - Carroll (Reliquiae Farlowianae *571*); Cheshire (13); Coos (*Allen 168*); Grafton (*Cummings*).

Rhabdoweisia crispata (With.) Lindb. - Coos (*Allen 169*); Grafton (*Hutchinson*).

DITRICHACEAE

Ceratodon purpureus (Hedw.) Brid. - Coos (Grout, N.A.M. Perf. *378*).

Distichium capillaceum (Hedw.) Bruch & Schimp. in B.S.G. - Coos (6).

Ditrichum pallidum (Hedw.) Hampe - Grafton (*Hutchinson*).

pusillum (Hedw.) Hampe - Coos (*Wickes*).

FABRONIACEAE

Anacamptodon splachnoides (Fröl. ex Brid.) Brid. - Coos (6); Grafton (23).

FISSIDENTACEAE

Fissidens bryoides Hedw. - Grafton (26); Merrimack (*Allen 10038*).

bushii (Card. & Thér.) Card. & Thér. - Grafton (*Hutchinson*).

dubius P. Beauv. - Carroll (*Lowe*); Grafton (*Hutchinson*).

osmundioides Hedw. - Carroll (*Farlow*); Grafton (*Cummings*).

FONTINALACEAE

Dichelyma capillaceum (With.) Myr. - Belknap (32); Carroll (32); Cheshire (32); Coos (32).
  falcatum (Hedw.) Myr. - Carroll (Grout, N.A.M. Pleur. *396*); Cheshire (32); Coos (Reliquiae Farlowianae *579*).
  pallescens Schimp. in B.S.G. - Carroll (32).
Fontinalis antipyretica Hedw. - Cheshire (32); Coos (32); Grafton (23); Merrimack (*Allen 10040*).
  antipyretica var. *gigantea* (Sull.) Sull. - Belknap (32); Carroll (*James*); Cheshire (32); Coos (32); Grafton (*Churchill*); Hillsborough (32); Sullivan (*Butler*).
  dalecarlica Schimp. in B.S.G. - Belknap (*Carter*); Carroll (*James*); Cheshire (32); Coos (*von Schrenk*); Grafton (Grout, Hand-lens Mosses *99*); Hillsborough (32); Merrimack (*Allen 10041*); Sullivan (*Butler*).
  flaccida Ren. & Card. - Coos (32); Rockingham (32).
  novae-angliae Sull. - Belknap (32); Carroll (32); Cheshire (32); Grafton (*Hutchinson*); Hillsborough (32); Merrimack (*Allen 10030*).
  sullivantii Lindb. - Carroll (*Austin 6*, NY).

GRIMMIACEAE

Coscinodon cribrosus (Hedw.) Spruce - Coos (18).
Grimmia donniana Sm. - Coos (*Allen 1434*).
  hartmanii Schimp. - Coos (*James*).
Racomitrium aciculare (Hedw.) Brid. - Carroll (5); Cheshire (13); Coos (*Rickett 125*); Grafton (*Cummings*).
  canescens (Hedw.) Brid. - Carroll (*Lowe*); Grafton (Holzinger, M.Acro.Bor.-Amer. *341*).
  fasciculare (Hedw.) Brid. - Cheshire (13); Coos (Grout, N.A.M. Perf. *106*).
  heterostichum (Hedw.) Brid. - Cheshire (13); Grafton (9).
  lanuginosum (Hedw.) Brid. - Coos (Reliquiae Farlowianae *568*).
  microcarpon (Hedw.) Brid. - Coos (*Grout 189*).
  sudeticum (Funck.) Bruch & Schimp. in B.S.G. - Carroll (Reliquiae Farlowianae *569*); Coos (*Wickes*); Grafton (*Cummings*).
Schistidium agassizii Sull. & Lesq. in Sull. - Grafton (*Cummings*).
  apocarpum (Hedw.) Bruch & Schimp. in B.S.G. - Coos (*James*); Grafton (9, 10).
  rivulare (Brid.) Podp. - Carroll (*James*); Grafton (9).

HEDWIGIACEAE

Hedwigia ciliata (Hedw.) P. Beauv. - Carroll (Reliquiae Farlowianae *581*); Grafton (*Hutchison*).

HELODIACEAE

Helodium blandowii (Web. & Mohr) Warnst. - Grafton (22, 23).

HYLOCOMIACEAE

Hylocomiastrum pyrenaicum (Spruce) Fleisch. in Broth. - Grafton (10).
  umbratum (Hedw.) Fleisch. in Broth. - Coos (Reliquiae Farlowianae *593*); Grafton (*Cummings*).
Hylocomium splendens (Hedw.) Schimp. in B.S.G. - Coos (*von Schrenk*); Grafton (*Hutchinson*).
Pleurozium schreberi (Brid.) Mitt. - Coos (12); Hillsborough (*Smith*).
Rhytidiadelphus squarrosus (Hedw.) Warnst. - Coos (*Grout*).

triquetrus (Hedw.) Warnst. - Grafton (*Cummings*).

HYPNACEAE

Callicladium haldanianum (Grev.) Crum - Cheshire (Reliquiae Farlowianae *588*); Grafton (*Anderson*); Merrimack (*Allen 10034*).

Herzogiella striatella (Brid.) Iwats. - Coos (*Allen 170*); Grafton (9, 16).

turfacea (Lindb.) Iwats. - Grafton (16).

Hypnum imponens Hedw. - Coos (*Wickes*); Grafton (Grout, N.A.M. Pleur. *8*); Sullivan (*Butler*).

pallescens (Hedw.) P. Beauv. - Coos (Reliquiae Farlowianae *591*); Grafton (Grout, N.A.M. Pleur. *19*); Sullivan (*Butler*).

pratense (Rabenh.) W. Koch ex Spruce - Grafton (*Hutchinson*).

Isopterygiopsis muelleriana (Schimp.) Iwats. - Grafton (9, 10, 16, 22).

pulchella (Hedw.) Iwats. - Coos (16).

Platydictya subtilis (Hedw.) Crum - (Grout, N.A.M. Pleur. *12*).

Pseudotaxiphyllum distichaceum (Mitt.) Iwats. - Grafton (9).

elegans (Brid.) Iwats. - Coos (*Grout*); Grafton (9, 16).

Ptilium crista-castrensis (Hedw.) De Not. - Carroll (*James*); Grafton (*Cummings*).

Pylaisiella intricata (Hedw.) Grout - Coos (*James*); Grafton (*sin coll*).

selwynii (Kindb.) Crum et al. - Coos (*James*); Grafton (Grout, N.A.M. Pleur. *3*); Sullivan (*Butler*).

Taxiphyllum deplanatum (Bruch & Schimp. ex Sull.) Fleisch. - [Grafton (?)] *Grout*, July 15, 1903, sin. loc., (16).

LESKEACEAE

Leskea gracilescens Hedw. - Merrimack (*Allen 10051*).

Leskeella nervosa (Brid.) Loeske - Carroll (*James*).

Pseudoleskea radicosa (Mitt.) Mac. & Kindb. - Coos (Grout, N.A.M. Pleur. *399*).

LEUCOBRYACEAE

Leucobryum glaucum (Hedw.) Aongstr. ex Fries - Grafton (*Hutchinson*).

LEUCODONTACEAE

Leucodon brachypus Brid. - Grafton (*Cummings*).

brachypus var. *andrewsianus* Crum & Anderson - Grafton (*Hutchinson*).

MEESEIACEAE

Messia longiseta Hedw. - Coos (12).

MNIACEAE

Mnium hornum Hedw. - Coos (6).

marginatum (With.) Brid. ex P. Beauv. - Grafton (*Cummings*).

spinulosum (Voit) Schwaegr. - White Mountains (*James*).

stellare Hedw. - Grafton (*Grout 25*).

Plagiomnium ciliare (C. Müll.) T. Kop. - Cheshire (20); Coos (20); Grafton (*sin. coll.*); Hillsborough (*Lampton 615*); Sullivan (20).

cuspidatum (Hedw.) T. Kop. - Carroll (*Moore*); Grafton (*Anderson*).

drummondii (Bruch & Schimp.) T. Kop. - Grafton (*Cummings*).

ellipticum (Brid.) T. Kop. - Grafton (20).

medium (Bruch & Schimp.) T. Kop. - Carroll (20).

Pseudobryum cinclidioides (Hüb.) T. Kop. - Carroll (*James*); Grafton (*Grout 26*).
Rhizomnium appalachianum T. Kop. - Grafton (*Hutchinson*).
  magnifolium (Horik.) T. Kop. - Grafton (9).
  punctatum (Hedw.) T. Kop. - Grafton (Grout, Hand-lens Mosses *54*).

NECKERACEAE

Homalia trichomanoides (Hedw.) Schimp. in B.S.G. - Grafton (*Grout*).
Neckera pennata Hedw. - Carroll (*James*); Grafton (Grout, N.A.M. Pleur. *11*); Sullivan (*Butler*);

ORTHOTRICHACEAE

Amphidium lapponicum (Hedw.) Schimp. - White Mountains (*James*).
  mougeotii (Bruch & Schimp. in B.S.G.) Schimp. - Coos (6); Grafton (9).
Drummondia prorepens (Hedw.) Britt. - Grafton (30).
Orthotrichum obtusifolium Brid. - Coos (31); Grafton (*Hutchinson*); Merrimack (*Allen 10052*).
  ohioense Sull. & Lesq. in Aust. - Grafton (*Cummings*).
  pumilum Sw. - Grafton (31).
  pusillum Mitt. - Grafton (31).
  sordidum Sull. & Lesq. in Aust. - Belknap (31).
  speciosum var. elegans (Schwaegr. ex Hook. & Grev.) Warnst. - Coos (31); Grafton (10).
  stellatum Brid. - Grafton (*Cummings*); Coos (10, 31).
Ulota coarctata (P. Beauv.) Hammar - Carroll (*Grover*); Grafton (*Cummings*); Sullivan (*Butler*).
  crispa (Hedw.) Brid. - Coos (*Allen 167*); Grafton (*Cummings*); Merrimack (*Allen 10031*).
  hutchinsiae (Sm.) Hammar - Carroll (*Cummings*); Cheshire (*Lowe*); Grafton (*Hutchinson*).

PLAGIOTHECIACEAE

Plagiothecium cavifolium (Brid.) Iwats. - Carroll (16); Coos (12); Grafton (*sin. coll.*).
  denticulatum (Hedw.) Schimp. in B.S.G. - Coos (*Grout*); Grafton (9, 16); Sullivan (*Butler*).
  laetum Schimp. in B.S.G. - Coos (16).
  latebricola Bruch & Schimp. in B.S.G. - Coos (12).

POLYTRICHACEAE

Atrichum altecristatum (Ren. & Card.) Symth & Symth - Coos (17).
  angustatum (Brid.) Bruch & Schimp. in B.S.G. - Carroll (*Grover*).
  crispum (James) Sull. - Cheshire (13); Coos (17).
  oersteadianum (C. Müll.) Mitt. - Coos (17).
  undulatum (Hedw.) P. Beauv. - Grafton (9).
Pogonatum dentatum (Brid.) Brid. - Cheshire (13); Coos (2, 12).
  pensilvanicum (Hedw.) P. Beauv. - Merrimack (*Allen 10056*); Sullivan (*Butler*).
  urnigerum (Hedw.) P. Beauv. - Coos (2).
Polytrichastrum alpinum (Hedw.) G.L. Smith - Coos (*Allen 1437*); Grafton (*Cummings*); Hillsborough (15).
Polytrichum commune Hedw. - Grafton (*Mathias 176*).
  formosum Hedw. - Coos (12); Grafton (*Mathias 235*).
  juniperinum Hedw. - Coos (*Allen 1436*); Grafton (*Cummings*).
  longisetum Brid. - Grafton (10).
  ohioense Ren. & Card. - Grafton (*Hutchinson*).

pallidisetum Funck - Grafton (*Mathias 177*).
piliferum Hedw. - Coos (*von Schrenk*); Grafton (29).
strictum Brid. - Cheshire (13); Coos (*Allen 1436*); Grafton (*Cummings*).

POTTIACEAE

Bryoerythrophyllum recurvirostre (Hedw.) Chen - Grafton (*Cummings*).

PTERIGYNANDRACEAE

Heterocladium dimorphum (Brid.) Schimp. in B.S.G. - Carroll (Grout, N.A.M. Pleur. *405*); Coos (Reliquiae Farlowianae *582*).
Pterigynandrum filiforme Hedw. - Coos (Grout, N.A.M. Pleur. *383*); Grafton (*Stone 436*).

SCHISTOSTEGACEAE

Schistostega pennata (Hedw.) Web. & Mohr - Carroll (Holzinger, M.Acro.Bor.-Amer. *315*); Grafton (*Hutchinson*).

SELIGERIACEAE

Blindia acuta (Hedw.) Bruch & Schimp. in B.S.G. - Coos (*James*); Grafton (*Lorenz 237*).

SEMATOPHYLLACEAE

Brotherella recurvans (Michx.) Fleisch. - Grafton (Grout, N.A.M. Pleur. *1*).
Sematophyllum demissum (Wils.) Mitt. - Grafton (9).
marylandicum (C. Müll.) Britt. - Coos (6).

SPHAGNACEAE

Sphagnum angermanicum Melin - Grafton (14).
angustifolium (C. Jens. ex Russ.) C. Jens. in Tolf - Grafton (9).
palustre L. - Merrimack (*Allen 10046*).
russowii Warnst. - Coos (*Allen 1438*).
squarrosum Crome - Grafton (9).

SPLACHNACEAE

Splachnum ampullaceum Hedw. - Carroll (*Evans*).
Tetraplodon angustatus (Hedw.) Bruch & Schimp. in B.S.G. - Grafton (*Forman 264*).
mnioides (Hedw.) Bruch & Schimp. in B.S.G. - Coos (*Greenman 2744*); Grafton (*Mathias 233*).

TETRAPHIDACEAE

Tetrodontium brownianum (Dicks.) Schwaegr. - Coos (6); Grafton (10).
Tetraphis geniculata Girg. ex Milde - Coos (6); Grafton (4, 24).
pellucida Hedw. - Carroll (*Bartlett 1216*); Cheshire (*Ladd 7339*); Coos (6); Grafton (Grout, Hand-lens Mosses *6*); Sullivan (*Butler 5479*).

THUIDIACEAE

Thuidium delicatulum (Hedw.) Schimp. in B.S.G. - Carroll (*Grover*); Cheshire (*Seymour*); Grafton (*sin. coll.*); Merrimack (*Allen 10058*).

Bibliography

1. Allen, B. 1991. A review of the *Fontinalis sullivantii* complex (Musci: Fontinalaceae). *Bryologist* 94: 430–434.
2. Ammons, N. 1934. Twenty minutes collecting bryophytes on Mount Washington summit.

Bryologist 37: 3-4.

3. Bazzaz, F. A., D. J. Paolillo, Jr., & R. H. Jagels. 1970. Photosynthesis and respiration of forest and alpine populations of *Polytrichum juniperinum*. *Bryologist* 73: 579-585.
4. Beattie, F. S. 1914. *Georgia geniculata* in New Hampshire. *Bryologist* 17: 48.
5. Dunham, E. M. & R. L. Lowe. 1927. Mosses of unusual growth or unusual habitat. *Bryologist* 30: 62-65.
6. Forman, R. T. T. 1961. Some mosses from Mt. Washington, New Hampshire. *Bryologist* 64: 378-380.
7. Glime, J. M. 1970. Zonation of bryophytes in the headwaters of a New Hampshire stream. *Rhodora* 72: 276-279.
8. _____. 1971. Response of two species of *Fontinalis* to field isolation from stream water. *Bryologist* 74: 383-386.
9. _____. 1982. Bryophytes of the Flume, Franconia Notch State Park, N. H. *Rhodora* 84: 149-151.
10. Grout, A. J. 1899. An annotated list of rare or otherwise interesting mosses occurring in or near Plymouth, New Hampshire. *Rhodora* 1: 53-55.
11. _____. 1928. *Moss flora of North America north of Mexico*. Vol 3, part 1: 1-62.
12. _____. 1940. Mosses of Mount Washington, 1939. *Bryologist* 43: 36-38.
13. Haring, I. M. 1939. A collectiong trip on Mount Monadnock, New Hampshire. *Bryologist* 42: 28.
14. Holcombe, J. W. 1979. *Sphagnum angermanicum* in New Hampshire. *Bryologist* 82: 616-618.
15. Ireland, R. R., Jr. 1960. Notes on *Pogonatum alpinum* in eastern United States & Canada. *Bryologist* 63: 46-50.
16. _____. 1969. A taxonomic revision of the genus *Plagiothecium* for North America, north of Mexico. *National Museums of Natural Sciences Publications in Botany* 1: 1-118.
17. _____. 1969. Taxonomic studies on the genus *Atrichum* in North America. *Canadian Journal of Botany* 47: 353-368.
18. _____ & H. Crum. 1976. Distribution of *Grimmia cribrosa* in North America. *Bryologist* 79: 355-357.
19. Jamieson, D. J. 1976. A monograph of the genus *Hygrohypnum* Lindb. (Musci). Ph.D. Dissertation, 425 pp. University of British Columbia.
20. Koponen, T. 1971. A monograph of *Plagiomnium* sect. *Rosulata* (Mniaceae). *Annales Botanici Fennici* 8: 305-367.
21. Lawton E. 1961. A revision of the genus *Rhabdoweisia*. *Bryologist* 64: 140-156.
22. Lorenz, A. 1906. Notes on the mosses of Waterville, N. H. *Bryologist* 9: 96-97.
23. _____. 1907. Notes from Waterville, New Hampshire II. *Bryologist* 10: 102-103.
24. _____. 1909. *Georgia geniculata* in New Hampshire. *Bryologist* 12: 10.
25. Ochyra, R. 1987. A revision of the moss genus *Sciaromium* (Mitt.) Mitt. III. The section *Platyloma* Broth. *Journal of the Hattori Botanical Laboratory* 63: 107-132.
26. Pursell, R. A. 1957. A taxonomic revision of North American *Fissidens* section *Bryoidium*. Ph.D. Dissertation, 115 pp. + 9 pls. Florida State University.
27. Rushing, A. E. 1986. A revision of the genus *Bruchia* Schwaegr. *Journal of the Hattori Botanical Laboratory* 60: 35-83.

28. Shaw, A. J. 1981. Taxonomic revision of the propaguliferous species of *Pohlia* in North America. *Journal of the Hattori Botanical Laboratory* 50: 1-81.
29. Thomson, J. W. 1957. The 1956 foray of the American Bryological Society. *Bryologist* 60: 39-42.
30. Vitt, D. H. 1972. A monograph of the genus *Drummondia*. *Canadian Journal of Botany* 50: 1191-1208.
31. ____. 1973. A revision of the genus *Orthotrichum* in North America, north of Mexico. *Bryophytorum Bibliotheca* 1: 1-207. + 60 pls.
32. Welch. W. H. 1960. *A monograph of the Fontinalaceae*. 357 pp. M. Nijhoff, The Hague.
33. Wynne, F. E. 1942. A revision of the North American species of *Drepanocladus*. Ph.D. Dissertation, 231 pp. 10 pl. 13 map. University of Michigan.
34. Zales, W. M. 1973. A taxonomic revision of the genus *Philonotis* for North America, North of Mexico. Ph.D. Dissertation, 167 pp. Univeristy of British Columbia.

The 17th Annual Andrews Foray will be held in northwest New Jersey from 11-13 September 1992. This region includes the highest spots in the state, a fabulous inland southern white cedar swamp, beautiful rich fens, calcareous rock outcrops and the Delaware Water Gap. For information contact: **Dr. Eric F. Karlin, Institute for Environmental Studies, Ramapo College of New Jersey, mahwah NJ 07430-16809. Phone (201) 529-7743, Fax (201) 529-7508.**

10th Midwest Bryological & Lichenological Foray. There will be a bryophyte foray in the Upper Peninsula of Michigan on Friday 11 to Sunday 13 September, 1992. The habitats to be visited include conifer-deciduous woodlands along the river, peatlands, and the coast of Lake Superior. All professionals, students, and amateurs are welcome. For additional information contact: **Janice M. Glime, Department of Biological Sciences, Michigan Technological University, 1400 Townsend Drive, Houghton, MI 49931. Phone (906) 487-2546.**

Pohlia longicolla (Hedw.) Lindb. new to Wyoming

P. M. Eckel [1]

While sorting through specimens on loan from the Rocky Mountain Herbarium, Laramie, Wyoming, a specimen of *Pohlia* was found that has not hitherto been reported for the state.

> *Pohlia longicolla* (Hedw.) Lindb. Wyoming, Big Horn Co., Big Horn Mountains; east end of Battle Park, ca. 9 miles SW of Cloud Peak, ca. 20 miles ESE of Basin, sandstone ledges, elev. 9100 ft. Nelson & Fonken 7354, with deoperculated fruit, August 19, 1980 (RM, Ithaca College).

The distribution of this species in North America, as reported by Crum and Anderson (1981), is north temperate from Greenland to the Aleutians and south to North Carolina and Tennessee through the Appalachian Mountains in the east from New England and New York, and in the west from Alberta south to Colorado. Lawton (1971) reported a station in Montana and associated the species with the Canadian Rocky Mountains. Its location in the Big Horn Mountains of Wyoming is consistent with the general pattern of this distribution and with montane associations (described by Lawton as alpine).

Key diagnostic characters are the poorly developed cilia of the endostome, long-linear leaf cells, the glossy green to yellow-green to golden leaves resembling *Pohlia cruda* but narrower and without the latter's distinctive broad glossy blue-green (glaucous) to hyaline leaves. The capsules are elongate, the neck generally shorter than the urn to equalling it. The narrow endostome segments of the Wyoming specimen, with fused rather than open keels, are consistent with the description by Lawton (1971) and help to distinguish the specimen from the more elaborate-appearing broader, fenestrated or perforated segments of the common *Pohlia nutans* with their well developed, appendiculate cilia. *Pohlia elongata*, the other species closest in appearance to *P. longicolla*, was not seen and the reader is referred to distinctions described by Lawton (1971) and Crum & Anderson (1981).

Acknowledgement is made to Richard Zander for his support of the author's research into the flora of Wyoming, and for Jon Shaw for his verification of the identification. The author is grateful for the loan of specimens from the Rocky Mountain

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[1] Clinton Herbarium, Buffalo Museum of Science, Buffalo, N.Y. 14211

Herbarium of the University of Wyoming, Laramie. Research on the Wyoming moss flora is supported with a grant from the Savage Fund of the Buffalo Society of Natural Sciences.

Literature Cited

Crum, H. & L. Anderson. 1981. *Mosses of Eastern North America*. Columbia University Press.

Lawton, E. 1971, *Moss Flora of the Pacific Northwest*. Hattori Botanical Laboratory, Nichinan.

Bruchia hallii in Louisiana

William D. Reese[1]

Bruchia hallii Aust. is a rare moss of the southeastern United States. It was recently reported new to Alabama, with a review of its distribution, by Bowers & Rushing (1991). I here report the first collections of this moss from Louisiana:

> *Bruchia hallii* Aust. LOUISIANA. WINN PARISH. Small saline prairie openings in low pine-oak forest, 4-5.6 km NW of Tullos, 2.4-1.6 km W of Castor Creek; scarce and scattered among scanty grasses in open prairie; growing with *Archidium* sp. and *Bruchia flexuosa* (Sw. *ex* Schwaegr.) C. Müll., 13 March 1992, *Reese 18085* (LAF), *18091* (LAF, MICH).

The saline prairies are grass-dominated openings in the forest, with somewhat saline soils devoid of vegetation in some areas. Other bryophytes of interest, in addition to those noted above, also grew in the open saline prairies, including *Ephemerum cohaerens* (Hedw.) Hampe, *Fossombronia* sp., and *Pleuridium sullivantii* Aust.

Acknowledgment. I thank Nelwyn McInnis, Louisiana Natural Heritage Program, for informing me of and guiding me to the saline prairies.

Literature Cited

Bowers, F.D. & A.E. Rushing. 1991. *Bruchia hallii* in Alabama. *The Bryologist* 94: 55-56.

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Should mosses have common names?
Part 7. The Common Names of Funariales

Janice M. Glime[1]

The Splachnaceae have the most colorful names among the mosses due to their intriguing capsules. Such names as parasol moss, cow moss, collar moss, kettle moss, trumpet moss, carrion moss, squid moss, and lemming moss describe the many distinctive features of the family. All the species live on animal carcasses or dung, and their capsules are often highly modified to attract flies, which in turn transport the spores to fresh dung. The most highly modified is *Splachnum rubrum*, which has an iridescent purplish red hypophysis at the base of the capsule, looking like a striking mushroom emanating from the leafy moss tip.

Millimeter moss seems appropriate for the tiny *Micromitrium tenerum*, and emerald dewdrops is a charming name for *Ephemerum*. Of course, *Funaria hygrometrica* is the twisted cord moss, referring to its twisted seta, but the Japanese name of gourd moss is probably more distinctive. It has acquired several names that refer to its habit of growing on charcoal (Cinderella, charcoal peddler). The name of predictor moss for several of the *Funaria* species refers to the twisting of the seta in response to humidity changes, a character that has also earned it the names of water measuring cord moss and fortune moss.

Conventions in formatting follow Glime (1989). The meaning of the scientific name, as supplied by Elizabeth Dunham, is provided immediately after the scientific name. Any structure to which the name applies is in parentheses. Nomenclature follows Anderson, *et al*. (1990).

Disceliaceae
Discelium Brid.: thin-capsule moss[14]
Discelium nudum (Dicks.) Brid.: naked weissia[8]; naked moss[11]; twisted seta moss[13]; flag moss[25]

Ephemeraceae
Ephemerum Hampe: emerald dewdrops[10]; short-lived moss[14]; Brownies[17]; day moss[25]
Ephemerum cohaerens (Hedw.) Hampe: clustered earth moss[11]; northern short-lived moss[14]
Ephemerum serratum (Hedw.) Hampe: serrated earth moss[11]; common short-lived moss[14]; serrated earth-moss[20]; juniper day moss[25]
Ephemerum spinulosum Bruch & Schimp. in Schimp.: Brownies[17]

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Micromitrium Aust.: crown moss[13]

Micromitrium tenerum (Bruch & Schimp. in B.S.G.) Crosby: crown moss[13]; millimeter moss[25]

Funariaceae

Entosthodon Schwaegr.: delicate gourd moss[13]; cup moss[25]

Entosthodon attenuatus (Dicks.) Bryhn: Templeton's entosthodon[8]; Templeton's cord moss[11]

Entosthodon fascicularis (Hedw.) C. Mull.: blunt pear-shaped beardless moss[8]; fallow-field bladder moss[11]; arable land cup moss[25]

Funaria Hedw.: cord (twisted seta)[9]; cord mosses[2, 4]; cord moss[8, 10]; gourd moss[13]; calabash moss[14]; fortune moss[25]

Funaria flavicans Michx.: pale funaria[4]

Funaria hygrometrica Hedw.: cord moss[1, 3, 6]; water measuring cord moss[2]; water-measuring cord-moss[4]; twisted-cord moss[5]; common cord moss[7, 8, 11]; Cinderella, charcoal peddler[10]; gourd moss[13]; common calabash moss[14]; cord-moss[17]; common cord-moss[20]; predictor moss[25]

Funaria microstoma Bruch ex Schimp.: small-mouth calabash moss[14]

Funaria muhlenbergii Turn.: Dr. Muhlenberg's cord moss[8]; Muhlenberg's cord moss[11]; chalk predictor moss[25]

Physcomitrella Bruch & Schimp. in B.S.G.: false bell moss[13]

Physcomitrella patens (Hedw.) Bruch & Schimp. in B.S.G.: spreading-leaved earth moss[11]

Physcomitrium (Brid.) Brid.: bladder cap (calyptra)[9]; bladder-cap moss[4]; bell moss[13]; bowl moss[14]; hood moss[25]

Physcomitrium pyriforme (Hedw.) Hampe: urn moss[1, 2, 3]; top-moss[4]; common urn moss[6]; sharp pear-shaped beardless moss[8]; top moss, urn moss[10]; pear- fruited bladder moss[11]; urn moss, top moss[16]; large hood moss[25]

Pyramidula tetragona (Brid.) Brid.: pyramid moss[25]

Oedipodiaceae

Oedipodium Schwaegr.: long neck moss[14]

Oedipodium griffithianum (Dicks.) Schwaegr.: Griffithian club-stalked moss[8]; gouty moss[11]; ishizuchi moss (mountain in Shikoku)[13]; common long neck moss[14]; club moss[25]

Splachnaceae (dung mosses)

Aplodon wormskjoldii (Hornem.) Kindb.: carrion moss[25]

Splachnum ampullaceum Hedw.: flagon-fruited splachnum[8]; flagon- fruited collar moss[11]; common kettle moss[14]; cow moss[25]

Splachnum luteum Hedw.: yellow collar-moss[4]; petticoat moss[10]; yellow kettle moss[14]; yellow parasol moss[25]

Splachnum luteum var. *melanocaulon* Wahlenb.: little parasol moss[25]

Splachnum luteum var. *melanocaulon* Wahlenb.: little parasol moss[25]

Splachnum rubrum Hedw.: red collar moss[2]; red collar-moss[4]; fairy parasols[10]; red parasol moss[25]

Splachnum sphaericum Hedw.: globe-fruited splachnum[8]; round-fruited collar moss[11]; egg-leaf kettle moss[14]; long-shafted cow moss[25]

Splachnum vasculosum Hedw.: large-fruited splachnum[8]; large urn moss[13]; common kettle moss[14]; blood red cow moss[25]

Tayloria Hook.: lily moss[13]; small- kettle moss[14]; trumpet moss[25]

Tayloria acuminata Hornsch.: point-leaf small-kettle moss[14]

Tayloria froelichiana (Hedw.) Mitt. ex Broth.: Froelichian splachnum[8]; mountain trumpet moss[25]

Tayloria lingulata (Dicks.) Lindb.: tongue-leaf small-kettle moss[14]; marsh trumpet moss[25]

Tayloria serrata (Hedw.) Bruch & Schimp. in B.S.G.: slender splachnum[8]; slender collar moss[11]; saw trumpet moss[25]

Tayloria splachnoides (Schleich. ex Schwaegr.) Hook.: splachnoid cyrtodon[8]; marsh collar moss[11]; dried squid moss (teeth move like dry squid when it is steamed)[13]

Tetraplodon Bruch & Schimp. in B.S.G.: quartette mosses[4]; round base moss[13]; joined-teeth moss[14]; lemming moss[25]

Tetraplodon angustatus (Hedw.) Bruch & Schimp. in B.S.G.: narrow- leaved splachnum[8]; narrow-leaved collar moss[11]; lily fruit moss[13]; narrow-leaf joined-teeth moss[14]; toothed lemming moss[25]

Tetraplodon mnioides (Hedw.) Bruch & Schimp. in B.S.G.: brown tapering splachnum[8]; brown tapering collar moss[11]; round base moss[13]; common joined-teeth moss[14]; lemming moss[25]

Tetraplodon pallidus Hag.: yellow lemming moss[25]

Tetraplodon urceolatus (Hedw.) Bruch & Schimp. in B.S.G.: alpine lemming moss[25]

Voitia Hornsch.: hidden kettle moss[14]

Splachnobryaceae

Splachnobryum obtusum (Brid.) C. Mull.: short kettle moss[14]

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[1] Grout, A. J. 1900. *Mosses with a hand- lens*. Press of Binghampton Republican, New York, 74 Pp.; Grout, A. J. 1903. *Mosses with a handlens and microscope*. By Author. N. Y.

[2] Bland, J. 1971. *Forests of Lilliput*. Prentice-Hall, Inc., Englewood Cliffs. 210 Pp.

[3] Shuttleworth, F. S. & H. S. Zim. 1967. *Non-flowering plants. Ferns, mosses, lichens, mushrooms and other fungi*. A Golden Nature Guide, Golden Press, N.Y. 160 Pp.

[4] Marshall, N. L. 1907. *Mosses and lichens*. Doubleday, Page, & Co., N. Y. 327 Pp.

[5] Harthill, M. P. & I. O'Connor. 1975. *Common mosses of the Pacific coast*. Naturegraph.

[6] Welch, W. H. 1957. *Mosses of Indiana. An illustrated manual*. The Bookwalter Company, Indianapolis. 478 Pp.

[7] Jewell, A. L. 1955. *The observer's book of mosses and liverworts*. Frederick Warne and Co. Ltd., N. Y.

[8] Stark, R. M. 1860. *A popular history of British mosses, 2nd edition*. Routledge, Warne, & Routledge, London (Wheldon & Wesley), 348 Pp.

[9] Dunham, E. M. 1951. *How to know the mosses*. The Mosher Press, Boston.

[10] Crum, H. 1976. *Mosses of the Great Lakes forest, revised edition*. Univ. Mich. 10: 1-404.

[11] Tripp, F. E. 1888. *British mosses, their homes, aspects, structure and uses*. George Bell & Sons, Covent Garden, London (Wheldon & Wesley), 2 Vol.

[13] Dr. Zen Iwatsuki (personal communication)

[14] Jinkun Zhang (personal communication, translated from Wu *et al.* 1984)

[16] Thomas, L. P. & J. R. Jackson. 1985. *Walk softly upon the earth. A pictorial guide to Missouri mosses, liverworts and lichens.* Missouri Department of Conservation, Jefferson City, 129 pp.

[17] Britton, E. G. 1900. Mosses. *Nature Study Leaflets, Natural Science Committee of the Associate Alumnae of the Normal College, New York City* 4: 1-9.

[20] Russell, T. H. 1910. *Mosses and liverworts. An introduction to their study, with hints as to their collection and preservation*. Sampson Low, Marston & Co., LD. 211 Pp., 10 plates.

[25] Hallinback, T. & L. Soderstrom. 1987. Sveriges mossor och deras svenska namm -- en kommenterad checklista. [The bryophytes of Sweden, an annotated checklist with common names.] *Svensk Bot. Tidskr.* 81: 357-388.

Literature Cited

Anderson, L. E., Crum, H. A. & Buck, W. R. 1990. List of the mosses of North America North of Mexico. *Bryologist* 93: 448-499.

Glime, J. M. 1989. Should mosses have common names? *Evansia* 6(1):1-6.

The North American distribution of *Peltigera retifoveata* Vitik.

Bernard Goffinet [1]

Peltigera retifoveata Vitik. has recently been described as a new species (Vitikainen 1985). Being distinctly tomentose it belongs to the *Peltigera canina*-group. It is distinguished by its lower surface with a clear network of pale to brownish (rarely dark brwon) veins, squarrose branches and pit-like (fovea) white interstices. Chemically, *Peltigera retifoveata* can be separated from all other members of the group by producing depsides (tenuorine and methyl gyrophorate) and triterpenoid hopanes (zeorin and dolichorrhizin; Vitikainen 1985). Most of the collections belonging to *Peltigera retifoveata* where initially identified as *P. scabrosa* Th. Fr. from which *P. retifoveata* is separated clearly by having tomentum and a smooth upper cortex. The specimen collected by Nyland (168, CAFB) is partly severely damaged (patches of upper cortex have disintegrated) and has produced many regeneration lobulis along the cracks. This collection however belongs clearly to *P. retifoveata*, based on its lower surface and its chemistry which segregate it from *P. praetextata* .

Peltigera retifoveata *has a disjunct circumboreal range. It is known from western* North America and a few localities in Scandinavia and Siberia (Vitikainen 1985). *Peltigera retifoveata* is presently unknown from eastern North America (Harris, pers. com.), despite apparently suitable environments. The collection from Washington is the only one known from continental United States.

P. retifoveata grows on sandy acidic soil, and over humus and feather mosses in the boreal forest. In British Columbia, it is known from "semi-desert, dry grassland in central and southern interior, including the more arid, open woodlands" (Noble *et al.* 1987). Talbot's collections from the Nahanni National Park (N.W.T.) were made in montane *Picea glauca* and *Picea mariana* forests with ericaceous shrubs (*Ledum* and *Vaccinium*) and mosses (*Hylocomium splendens* and *Ptilium crista-castrensis*). According to label information, the specimen from Washington was collected in alpine tundra, while the Wyoming specimen was found on a rotten log in a spruce-fir forest.

Specimens examined (ALTA, unless otherwise specified):

Canada: **Alberta**: Banff National Park, Lake Minnewaka, *Brodie*, Sept. 18, 1965; Hinton area, Fairfax Lake, *Dumais & Anderson*, July 5, 1968; Pierre Grey Lakes Recreation area, *Horton 3334* (in *P. malacea* collection); Pelican Mills Road W of Hwy 63, *Johnson 72690* (CAFB); Along Judy Creek Gas Plant Road, *Johnson 72693*; On Proctor & Gamble road south of Pine Ridge turn-off, *Krumlik 72936*; Lesser Slave Lake area, Pine-lichen woodland, *La Roi,* Aug. 25, 1968; Lesser Slave Lake area, Marten River camground, *La Roi* , Aug. 25, 1968; Fort Assiniboine, *Marsh 1354* (CANL); Camp 12, Sawmill, Rocky, *Nyland 167* (CAFB); Red Deer Forestry Camp (in *P. canina*), *Nyland 145*; 3 1/2 miles up Spray River from Banff Springs Hotel, *Nyland 139*; Baptiste and North Saskatchewan Rivers, Rocky, *Nyland 168* (CAFB); Whitecourt, *Ostafichuk 257-12*; Waterton Lakes National Park, Blakiston Falls, *Ostafichuk 265-3*; James River, *Ostafichuk. 1035*; NW of Hinton, Jarvis Lake, *Ostafichuk 3593*; , NW of Hinton, Jarvis Lake, *Ostafichuk 3518*; Swan Hills, *Ostafichuk 337-8*; Swan Hills, *Ostafichuk 338-1*; Swan Hills, *Ostafichuk 339-10;* Caribou Mountains, Eva Lake, *Ostafichuk. 6759*; Burnt Timber Creek Campground, Cochrane-Nordegg road, *Ostafichuk 1027*; Caribou Mountains, Eva Lake, *Ostafichuk 6579*; Caribou Mountains, Eva Lake, *Ostafichuk. 6597*; Caribou Mountains, Eva Lake, *Ostafichuk 6599*; Caribou Mountains, Eva Lake, *Ostafichuk 6589*; Caribou Mountains, Eva Lake, *Ostafichuk. 6759*; Rocky Mountain House area, Crimson Lake, *Ostafichuk. 308-3*; Rocky Mountain House area, Crimson Lake, *Ostafichuk. 310-4*; Jasper Nat. Park, Jasper, *Ostafichuk. 453-5*; Fort Vermilion area, *Purchase*, 24 June 1968; Fort Vermilion area, *Purchase*, Aug 11, 1968; Wood Buffalo Park, Bear River, Little Buffalo Park, *Russel 41* (CANL). **British Columbia**: Kootenay Nat. Park, Daer Creek, *Berteau BB1009*; Liard River Basin, *Brodo & Hamilton 21462 & 21257* (CANL); East of Smithers, *T. Goward L16847* (CANL); Allison Lake, NNE of Princeton, *T.&B. Goward 83-514* (CANL); mile post 226 of Alaska Hwy, north of Fort St. John, *Horton 271*; mile post 257 of Alaska Hwy, north of Fort St. John, *Horton 90.* **Manitoba**: Iskwasum Lake, *Looman 636105.* **Northwest Territories**: Fort Norman, *Marsh 1604*; Fort Norman, Great Bear River, *Marsh 1634*; Wrigley, McConnell Lake, *Marsh. 1058*; Fort Good Hope, Hume River, *Marsh. 1956*; Norman Wells, Canol Road near Heart Lake, *Marsh 1582* (CANL, duplicate in CAFB); East of Fort McPherson, *Marsh 2438* (CAFB); Thekulthili Lake, *Scotter 2559* (CANL); South-central Ross Lake, *Scotter 1961* (CANL); North end of Gagnon Lake, *Scotter 2148* (CANL); Gagnon Lake, *Scotter 2199* (CANL); Heart Lake area, *Talbot 2109* (number written with a pencil on the package); Nahanni National Park, *Talbot T6208-24, T6089-21, T6006-25, T5051-14, T6082-17, T5039-1, T6055-27 & T6137-20* (all CANL). **Saskatchewan**: North side of Lake Athabasca, S. of Uranium City, *Harms & Sky 30505* (in *P. aphthosa* collection). **Yukon**: Clinton Creek area, *Ostafichuk 5564*; Clinton creek area, *Ostafichuk. 5566*; Dempster Hwy, *Ostafichuk. 5247.*

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United States of America: **Alaska**: Mt. Eielson, Copper Mt., *Weber & Viereck* 1956 (CANL). **Washington**: Okanogan Co., Snowshoe Mtn, *Douglas & Douglas 3664.*

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Literature Cited

Noble, W. J., T. Ahti, G. F. Otto & I. Brodo (1987) A Second Checklist and Bibliography of the Lichens and Allied Fungi of British Columbia. *Syllogeus* 61: 1-95.

Vitikainen O. (1985) Three new species of *Peltigera* (lichenized Ascomycetes). *Ann. Bot. Fennici* 22:291-298.

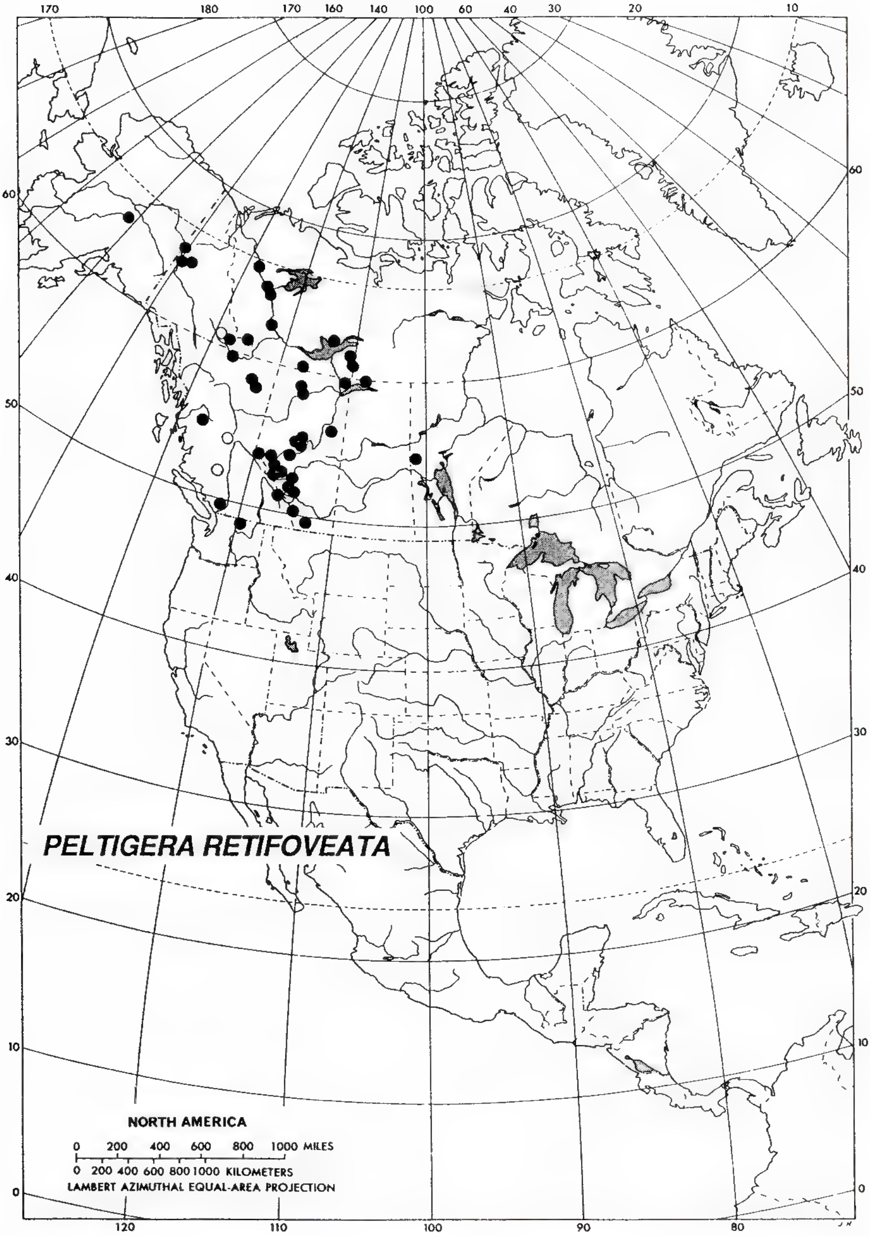
170
180
170
160
140
100
60
40
30
20
10
60
50
40
30
20
10
0
PELTIGERA RETIFOVEATA
NORTH AMERICA
0 200 400 600 800 1000 MILES
0 200 400 600 800 1000 KILOMETERS
LAMBERT AZIMUTHAL EQUAL-AREA PROJECTION
120
110
100
90
80

Figure 1: North American distribution of *Peltigera retifoveata* Vitikainen (closed circles, specimens presently in ALTA, CAFB and CANL; open circles, additional localities given in Vitikainen 1985, but not seen in the present study).

Hepatics of Bad Branch Nature Perserve, Letcher County, Kentucky

Paul G. Davison[1] and Allen C. Risk[2]

Forty-one taxa of liverworts were collected during the Sixth Blomquist Bryological Foray held the 14 September 1991 at Bad Branch Nature Preserve, Letcher County, Kentucky. Thirteen additional species collected by one of us (ACR) during previous trips to the preserve are also included in the following list. *Anastrophyllum michauxii*, *Leucolejeunea conchifolia*, *Marsupella paroica*, *Metzgeria leptoneura*, *Plagiochila caduciloba*, and *Porella japonica* subsp. *appalachiana* are significant new additions to the hepatic flora of Kentucky, with each representing a new range extension into the Cumberland Mountain system. *Plagiochila virginica* and *Radula mollis* are also reported new to Kentucky.

Bad Branch Nature Preserve is located on the southeast face of Pine Mountain. Pine Mountain was formed by an overthrust fault and is a long ridge, ca. 2800-3000 feet in elevation, that basically parallels the Kentucky-Virginia border. The strata of the mountain dip toward the southeast. Pine Mountain has a very steep northwest face which consists of the cut-off ends of strata and a more gentle southeast face whose slope often follows the dipping of the bedding planes. This tilting of the strata strongly influences the nature of the sandstone cliffs in the preserve. Bad Branch is a fast-flowing, perennial stream with a 65 foot waterfall in its lower gorge (elevation ca. 2120 ft.) The preserve also has smaller waterfalls, many cascades, and numerous sandstone cliffs with moist grottoes and overhangs.

Taxa newly reported to Kentucky and not listed by Snider et al. (1988) are preceded by an *. Nomenclature generally follows Schuster (1966, 1969, 1974, 1980) and Stotler & Crandall-Stotler (1977). Collectors are abbreviated as follows: MLH for Marie L. Hicks, PGD for Paul G. Davison, and ACR for Allen C. Risk. Voucher specimens are housed in The University of Tennessee Herbarium and the Morehead State University Herbarium.

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* *Anastrophyllum michauxii* (Web.) Buch. - dry, west-facing sand-stone cliff, *ACR 1038.*

Bazzania denudata (Torrey) Trev. - shaded rock faces, *PGD 1718, ACR 2247.*

B. trilobata (L.) S. F. Gray - rock, *MLH 17506*, moist, sandy soil by stream, *ACR 759.*

Blepharostoma trichophyllum (L.) Dum. - wet sandstone outcrop by stream, *ACR 884.*

Calypogeia mulleriana (Schiffn.) K. Muell. - rock, *MLH 17504, ACR 994, 1024*; bare soil of streambank, *ACR 769.*

C. sullivantii Aust. - disturbed soil near falls, *MLH 17502, PGD 1717*; moist soil at base of *Liriodendron tulipifera, ACR 1682.*

Cephalozia bicuspidata (L.) Dum. - wet sandstone outcrop by stream with *Jungermannia crenuliformis, ACR 889.*

C. lunulifolia (Dum.) Dum. - shaded rock, *MLH 17503, PGD 1700*; rotten log, *ACR 1689.*

Cololejeunea biddlecomiae (Aust.) Evans. - bark of *Cornus florida* and other deciduous species, *PGD 1704, ACR 765*; sandstone outcrop, *ACR 868.*

Conocephalum conicum (L.) Lindb. - moist sand near stream, *ACR 780.*

Diplophyllum apiculatum (Evans) Steph. - rock, *MLH 17516*; dripping sandstone ledges by stream, *ACR 795.*

Frullania asagrayana Mont. - bark of yellow birch, *MLH 17522*; sandstone boulders, *ACR 972, 1705*; on trunk of fallen hemlock, *ACR 1671.*

Geocalyx graveolens (Schrad.) Nees - rock, *MLH 17518, PGD 1707.*

Harpalejeunea ovata subsp. *integra* Schust. - bark of *Amelanchier arborea*, *PGD 1720.*

Harpanthus scutatus (Web. et Mohr) Spruce - rock, *PGD 1705.*

Herbertus aduncus subsp. *tenuis* (Evans) Mill. ex Scott - sand-stone, *PGD 1713, ACR 4884, 4892, 4894*; wet, sandy floor of grotto, *ACR 4872.*

Jamesoniella autumnalis (DC.) Steph. - rock, *MLH 17521, PGD 1706.*

Jubula pennsylvanica (Steph.) Evans - wet sandstone ledge by stream, *ACR 806.*

Jungermannia crenuliformis Aust. - wet rock, *PGD 1703.*

J. pumila With. - moist rock, *PGD 1698.*

Kurzia sylvatica (Evans) Grolle - rock, *PGD 1702*; wet sandstone by stream, *ACR 1758.*

Lejeunea laetivirens Nees et Mont. - dry sandstone cliffs, *ACR 1029, 1033*; sheltered rock faces, *MLH 17527, PGD 1715.*

L. lamacerina subsp. *gemminata* Schust. - rock, *PGD 1699.*

L. ulicina (Tayl.) Gott. - trunk of *Tsuga canadensis* with *Leucolejeunea conchifolia, PGD 1697.*

Leucolejeunea clypeata (Schwein.) Evans - rock, *MLH 17522*, deciduous tree trunk, *ACR 764, 1148.*

* *L. conchifolia* Evans - trunk of eastern hemlock, *PGD 1697.* This species, while primarily Coastal Plain in distribution, is widely spread throughout the Southern Appalachians and occurs in both the Blue Ridge and Cumberland Mountains of Tennessee (unpublished collections in TENN).

Lophocolea heterophylla (Schrad.) Dum. - on logs with *Nowellia curvifolia, MLH 17515, ACR 1699, 1700.*

Marsupella emarginata (Ehrh.) Dum. - wet rock, *MLH 17509, ACR 885, 887.*

* *M. paroica* Schust. - shaded rock crevice along creek, *MLH 17516*, occurring with *Diplophyllum apiculatum* and *Scapania nemorosa*. This Eastern North American endemic, while known from lower elevations (2500 ft.) in the Southern Escarpment Gorges of North Carolina, is more common at higher elevations in the Southern Appalachians; the closest known population to Bad Branch occurs on Whitetop Mountain at 5400 ft. in Smyth Co., Virginia (Schuster 1974).

M. sphacelata (Gieseke) Dum. - sandstone cliffs, *ACR 1006, 1502.*

Metzgeria crassipilis (Lindb.) Evans - rock, *MLH 17525*; bark of sycamore, *ACR 1509.*

M. furcata (L.) Dum. - moist sandstone outcrop near stream (with *Jubula pennsylvanica*), *ACR 1017.*

* *M. leptoneura* Spruce - moist rock face, *PGD 1716.*

M. myriopoda Lindb. - trunk of birch, *MLH 17523.*

Nardia lescurii (Aust.) Underw. - wet peaty soil by small stream, *ACR 1501.*

Nowellia curvifolia (Dicks.) Mitt. - decorticated logs, *MLH 17515, ACR 899, 1698.*

Odontoschisma denudatum (Nees ex Mart.) Dum. - log, *MLH 17514.*

O. prostratum (Sw.) Trev. - dry sandstone outcrop, *ACR 1000.*

Pellia epiphylla (L.) Corda - rock, *MLH 17505*; wet sandstone boulders along stream, *ACR 794, 967.*

Plagiochila asplenioides subsp. *porelloides* (Torrey ex Nees) Schust. - on rock with *P. caduciloba, MLH 17508, ACR 891.*

P. austini Evans - shaded, protected rock face, *PGD 1719, ACR 5804.*

* *P. caduciloba* Blomq. - rock crevice by a waterfall, *MLH 17508*, occurring mixed and hidden among the more robust stems of *P. asplenioides*. This disjunction to the Cumberland Mountains of Kentucky represents a significant range extension and supplants Linville Gorge, North Carolina, as the northernmost known locality of this Southern Appalachian endemic.

P. sullivantii Gott. ex Evans - boulder underledge, *PGD 1708.*

* *P. virginica* Evans - rock, *PGD 1715.*

* *Porella japonica* subsp. *appalachiana* Schust. - deeply shaded sandstone outcrop (somewhat moist and not protected by overhead rock ledges), *PGD 1714*, occurring with *Herbertus aduncus*, *Radula mollis*, and *R. obconica*. Previously known only from the type locality in the Southern Appalachian Escarpment region (Eastatoe River Gorge, South Carolina), *P. japonica* is otherwise restricted to eastern Asia as subsp. *japonica* (Schuster 1980). Plants from Bad Branch possess the distinctive "spinose to repand-dentate" leaf margins as illustrated by Schuster (1980, Fig. 639) and agree with material collected from the type locality (Davison #618, TENN). Questionable, entire-leaved material from Crow Creek, Cullasaja Gorge,

North Carolina (see Schuster 1980, pp. 623 and 684), is perhaps best referred to *Porella wautaugensis* (Sull.) Howe (see Hicks 1990).

P. platyphylla (L.) Pfeiff. - bark at base of tulip tree, *ACR 856.*

P. platyphylloidea (Schwein.) Lindb. - dry sandstone boulder, *ACR 971.*

* *Radula mollis* Lindenb. et Gott. - rock, *PGD 1712.*

R. obconica Sull. - rock, *ACR 874, 1023.*

R. tenax Lindb. - sandstone boulder, *ACR 5803.*

Riccardia multifida (L.) S. Gray - wet rock, *MLH 17501.*

R. palmata (Hedw.) Carruth. - moist logs, *PGD 1701, 1709, ACR 1687.*

Scapania nemorosa (L.) Dum. - wet sandstone along and in streams, *MLH 17511, ACR 767, 775, 782, 886.*

Trichocolea tomentella (Ehrh.) Dum. - sand of streambank, *ACR 781.*

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Literature Cited

Hicks, M. L. 1990. *Porella wautaugensis* (Sull.) Howe in the Southern Appalachian Mountains. *Castanea* 55: 223-228.

Schuster 1966, 1969, 1974, 1980. *The Hepaticae and Anthocerotae of North America*, vols. 1-4. Columbia University Press, New York.

Snider, J.A., S.M. Studlar, & M. Medley. A list of the bryophytes of Kentucky. *Bryologist* 91: 98-105.

Stotler, R., and B. Crandall-Stotler. 1977. A checklist of the liverworts of North America. *Bryologist* 80: 405-428.

Cladonia norvegica new to North America

Tor Tønsberg[1] & Trevor Goward[2]

Cladonia norvegica Tønsb. & Holien was first described by Tønsberg & Holien (1984) from Norway. Since then, however, this species has proved to be widely distributed, having now been reported from Sweden, Finland, West Germany, Austria, Czechoslovakia, Italy, Madeira and southern South America (Argentina and Chile) (Muhr 1987, Ruoss et al. 1987, Wirth 1987, Kuusinen et al. 1989, Timdal 1989, Stenroos & Ahti 1990). The purpose of this note is to document the further occurrence of *C. norvegica* in North America.

We first became aware of the presence of this species in North America during a field trip in the Interior Cedar-Hemlock Zone of south central British Columbia: here we found it growing over the shaded base of a *Pinus contorta* in a humid second-growth forest. This discovery prompted a careful search for additional material. As a result, Tønsberg collected further material in southern and south eastern Alaska, western Washington and Newfoundland and Labrador; and Goward detected a number of additional specimens from British Columbia, based on a revision of the material of *Cladonia coniocraea* in the herbarium of the University of British Columbia (UBC).

Our specimens conform well with the type of *C. norvegica*. The basal squamules are finely incised and, when well-developed, tend to be rather elongate. The podetia are subulate, and the largest of them tend to average about 10 mm to 20 mm in length, i.e. somewhat smaller than the Norwegian material studied by Tønsberg & Holien (1984), but larger than, for example, the material reported by Kuusinen et al. (1989) from Finland. Several specimens (e.g. TG 81-1855; TT 14200, 16000, 16646) bear the typical pale brown apothecia which place *C. norvegica* in the "Ochrophaea" group of the section *Cocciferae* (Stenroos & Ahti 1990). Finally, specimens examined by TLC were found to contain barbatic acid (major substance) and 4-0- demethylbarbatic acid, also typical of the species.

In the field *C. norvegica* is most likely to be confused with *C. coniocraea* (section *Cladonia*), with which it often occurs. These species, however, are readily distinguished chemically by the PD- reaction in *C. norvegica* (barbatic acid) versus

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the PD+ reaction in *C. coniocraea* (fumarprotocetraric acid). Also, the squamules of *C. norvegica* are usually smaller and more finely incised than those of *C. coniocraea* -- a character readily observed when the two species are found growing side by side. The pale apothecia of *C. norvegica* versus the dark brown apothecia of *C. coniocraea* provide a further character, though fertile specimens of both species tend to be rare.

Kuusinen et al. (1989) and Timdal (1989) discuss the occurrence of rhodocladonic-acid-containing red spots on the basal squamules of *C. norvegica*. The production of these spots is apparently triggered by the presence of a tiny mite which inhabits the squamules (Timdal 1989). In Europe the spots are said to be very common in this species -- so much so that their presence in proposed as a taxonomic character by Kuusinen et al. (1989). The fact that no red spots were observed in any of the North American specimens may indicate that the mite in question is sparse or absent on this continent. The small podetial size reported for *C. norvegica* by Timdal (1989) and Kuusinen et al. (1989) might simply be due to the fact that these specimens were infested and therefore too weak for optimal growth.

Cladonia norvegica appears to have a narrower ecological amplitude than *C. coniocraea*, being thus far restricted to humid forest types in wetter regions. Here it is corticolous and lignicolous at the bases of conifers, though a few specimens have also been collected over decaying logs. The known elevational range varies in North America from 80 m to about 1300 m, suggesting that *C. norvegica* is a temperate to oroboreal species not occurring above the Middle Oroboreal Zone. The most northerly North American locality known thus far is 60° 47' N. In Europe it is known as far north as 67° 58' N (see Tønsberg & Holien 1984).

North American specimens seen (if not otherwise stated Goward's material is deposited in UBC, Tnsberg's in BG). **Canada: British Columbia:** Clearwater Valley, Spahats Creek Provincial Park, 650 m, 1991, *Tønsberg 14200* (BG, UBC); Clearwater Valley, Wells Gray Provincial Park, Helmcken Falls area, 700 m, *Goward 91-70 & Tønsberg*; Garibaldi Provincial Park, Round Mountain, 1300 m, 1960, *Peterson BP 93*; Hazelton area, near bottom of Nine Mile Road, 350 m, *Goward 81-1855*; Lakelse Lake, mid-eastern shore, 80 m, *Goward 81-2068*; New Hazelton area, Mudflat Creek Valley, 1200 m, *Goward 81-1898*; Prince Rupert area, Hay's Mountain, 640 m, *Goward 81-2084*; Smithers area, Hudson Bay Mountain, 1250 m, *Goward 81-1825*; Terrace area, 10 km N of Kitsumkalum Lake, 150 m, *Goward 81-2022*. **Newfoundland and Labrador**, Newfoundland, Avalon Peninsula, along Big Barachois River, 1991, *Tønsberg 17096*. **U.S.A.: Alaska**: SE of Anchorage, Portage Valley, 3 km W of Portage Lake, just S of the road, 1991, *Tønsberg 15730, 15731, 15732*; Kenai Peninsula, 4 km S of Kenai Lake, W of Seward Highway, 1991, *Tønsberg 16000, 16001*; Borough of Juneau, NW of Juneau City, bank of Cowee Creek, N of the road, 1991, *Tønsberg 16293*; Baranof Island, Sitka, along Indian River, 1991, *Tønsberg 16500, 16502*. **Washington:** Olympic Peninsula, Clallam County, Olympic National Park, S of Port

Angeles, Heart of the Hills Campground, 1991, *Tønsberg 16646* (WTU); Whatcom County, S of Mt Baker, Sulphur Creek, 5 km W of Baker Lake, 500 m alt., 1991, *Tønsberg 16609.*

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Literature Cited

Kuusinen, M., Stenroos, S. & Ahti, T. 1989. Cladonia norvegica and C. incrassata in Finland. *Graphis Scripta* 2: 128-133.

Muhr, L.-E. 1987. Lavfloran i Gravbäcksravinen i Värmland. *Svensk bot. Tidskr.* 81: 17-36.

Ruoss, E., Mayrhofer, H. & Pongratz, W. 1987: Eine Rentier - und eine Becherflechte new für die Steiermark. *Mitt. Naturwiss. Ver. Steiermark* 117: 105-110.

Stenroos, S. & Anti, T. 1990. The lichen family Cladoniaceae in Tierre del Fuego: problematic or otherwise noteworthy taxa. *Ann. Bot. Fennici* 27: 317-327.

Timdal, E. 1989. The production of rhodocladonic acid in Cladonia bacilliformis and C. norvegica triggered by the presence of a lichenicolous mite. *Graphis Scripta* 2: 25-127.

Tønsberg, T. & Holien, H. 1984. Cladonia (sect. Cocciferae) norvegica, a new lichen species. *Nordic J. Bot.* 4: 79-82.

Wirth, V. 1987. *Die Flechten Baden-Württembergs. Verbreitungsatlas*. Eugen Ulmer, Stuttgart.

The Distribution of North American Bryophytes *Meesia uliginosa* Hedw.

Dale H. Vitt[1]

Meesia is a small genus characterized by acrocarpous plants; relatively small, rectangular upper leaf cells; no differentiated alar cells; strong, single costa with well differentiated internal structure; very long, erect seta; dark-colored capsules with a long, erect neck abruptly bent to the somewhat wider, horizontal urn; and reduced bryaceous (diplolepidous) peristome. Closely related genera include *Amblyodon* and *Paludella*. The four circumboreal species (*M. hexasticha, M. longiseta, M. triquetra,* and *M. uliginosa*) are largely differentiated by leaf shape and costal anatomy. *Meesia uliginosa* has ligulate, obtuse leaves with strongly revolute margins. The costa has inner cells larger than those near the edges (Nyholm 1975). Only *M. hexasticta* has leaves approaching those in shape to those of *M. uliginosa*, with the remaining two species having leaves varying around an ovate-lanceolate shape.

Meesia uliginosa is a decided calciphile, commonly occurring on small, soil covered ledges on calcareous rock outcrops. It is also found on small, organic mounds in arctic and alpine tundra and less commonly in boreal, calcareous (rich) fens. In both boreal rich fens and tundra meadows, it is largely replaced by *M. triquetra* and *M. longiseta*. Whereas *M. triquetra* and *M. longiseta* often occur in large, extensive populations, *M. uliginosa* most often is found in small populations of only a few plants. On montane, calcareous outcrops, it occurs with such species as *Encalypta alpina, E. rhaptocarpa, Pohlia cruda, Myurella julacea*, and *Plagiobryum zierii*, while in boreal rich fens it is associated with such species as *Tomenthypnum nitens, Catoscopium nigritum,* and *Campylium stellatum*.

The world distribution of this species has been mapped by Ochyra et al. (1988). They reported a more or less continuous circumboreal distribution, with disjunct occurrences in Tierra del Fuego and the Himalayas (Sikkim). In Europe, it is known as far south as Spain, Bulgaria, and the Caucasus, while in Asia it extends southward to northern Mongolia. They characterize it as having an arctic-boreal-montane distribution.

The North American distribution is, in general, boreal-montane. It occurs and is common from northern Alaska east to the Canadian Arctic Archipelago and Greenland, south in the west along the interior and Rocky Mountains to 50 degrees North Latitude. It also occurs sporadically in Montana, Wyoming, Colorado and in northern California. Not collected (except in high mountain alpine tundra) along the coastal areas of western North America. Eastward in the west it is known from northeastern Alberta and near Great Slave Lake, NWT. It is more infrequent in eastern North America, especially in areas dominated by the acidic Canadian Shield; otherwise collected from around Hudson Bay, the northern Great Lakes, the Gaspe and Maritime Provinces, Labrador, and south to New York.

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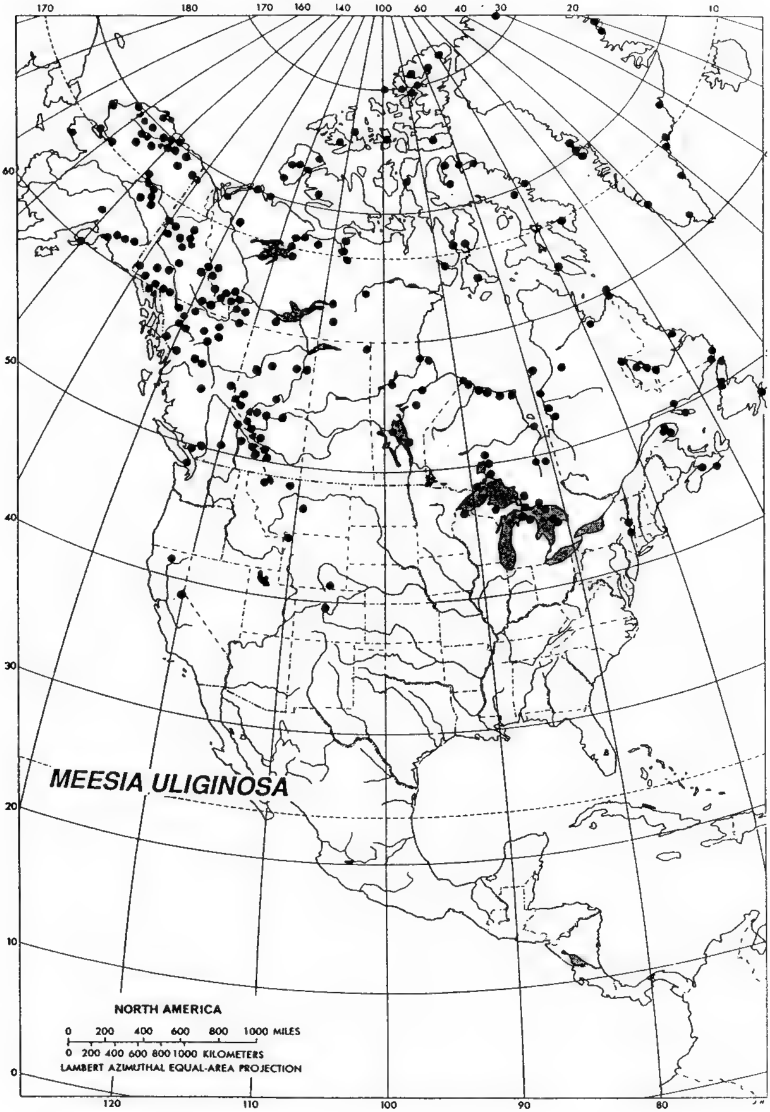
Literature Cited

Nyholm, E. *Illustrated Moss Flora of Fennoscandia II.* Musci Fasc. 3, 2nd. ed. pp. 189-288. Swedish Natural Science Research Council, Lund.

Ochyra, R. P. Szmajda, H. Bednarek, and W. Bochenski. 1988. M. 386. *Meesia uliginosa* Hedw. *In*: Tobolewski, Z. and T. Wojterski (eds.). *Atlas of the Geographical Distribution of Spore Plants in Poland*. Ser. V. Mosses (Musci), Part III, pp. 11-13.


MEESIA ULIGINOSA
NORTH AMERICA
0 200 400 600 800 1000 MILES
0 200 400 600 800 1000 KILOMETERS
LAMBERT AZIMUTHAL EQUAL-AREA PROJECTION
170
180
170
160
140
100
60
40
30
20
10
60
50
40
30
20
10
0
120
110
100
90
80

Los Musgos del Cerro Gordo (San Juan Teotihuacán) Valle de México

Angeles Cárdenas S.[1]

Desde 1982 se realizan trabajos de campo y de laboratorio para determinar y catalogar los musgos del Valle de México (Cárdenas, 1988). Debido a su extensión (7500 km^2) y a su gran diversidad topográfica y climática, el estudio de esta región se ha abordado dividiéndolo en áreas más pequeñas que, al mismo tiempo, sean representativas de los ambientes locales. Con esta idea, en esta contribución se presenta un listado de musgos del Cerro Gordo, una elevación de interés florístico e histórico; al pie de ella se desarrolló una de las culturas prehispánicas de mayor esplendor en México, la Teotihuacana.

El Cerro Gordo se localiza en la mitad septentrional del Valle de México (cf. Cárdenas & Delgadillo, 1992), a los 19° 46'N y 98° 48'W, con una altura de 3050 m snm. Es de origen Cuaternario y está constituido básicamente por fenobasaltos (Mosser, 1975). El clima dominante es seco con lluvias de verano, aunque en las partes altas se vuelve templado subhúmedo con lluvias de verano. En él se reconocen los siguientes tipos de vegetación:

-Bosque de *Quercus*, con *Q. crassipes*, *Q. greggii* y *Q. mexicana*, entre los 2800-3500 m de altitud.

-Matorral de *Quercus microphylla*, entre 2700-3000 m.

-Matorral Xerófilo de *Opuntia*, *Zaluzania* y *Mimosa*, hasta 2750 m de altitud.

-Pastizal de *Buchloë dactyloides* con *Hilaria cenchroides*, entre 2400-2600 m; el Zacatonal de *Stipa ichu* se localiza alrededor de los 3000 m.

Aunque estos tipos de vegetación son los más interesantes desde el punto de vista florístico, únicamente ocupan una fracción pequeña del área total ya que los cultivos y caminos están ampliamente extendidos. En la práctica es difícil separar los tipos de vegetación debido a que cambian gradualmente o varían con la perturbación (Castilla & Tejero 1987, Rzedowski et al. 1964).

A continuación se enlistan 65 especies y variedades de musgos del área, seguidos del nombre del colector y número de colecta; los ejemplares colectados por el autor sólo se citan por número de colecta. Además, se proporcionan datos de altitud y microhábitat.

---

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Aloina hamulus (C.Müll.) Broth. *32157b, 2171, 5192.* 2400-2750 m. Suelo en base de Compuesta, lugares expuestos o sombreados y secos o mojados.

Aloinella catenula Card. *2910, 2911.* 2900 m. Suelo, lugares soleados o expuestos y secos.

Archidium donnellii Aust. *4507, 4516a, 5018b.* 2950 m. Suelo compactado, lugares expuestos y mojados.

A. tenerrimum Mitt. *4514.* 2950 m. Suelo compactado, lugares expuestos y mojados.

Barbula orizabensis C. Müll. *2190b.* 3050 m. Suelo.

B. spiralis Schimp. *2153b, 2173, 2203b.* 2400-2600 m. Suelo, lugares expuestos y secos.

Brachythecium corbieri Card. *2189a, 4510.* 2950-3050 m. Suelo, lugares sombreados y secos o húmedos.

Braunia secunda (Hook.) B.S.G. *2199, 2200, 2246.* 3050 m. Roca o base de tronco de *Quercus*, lugares sombreados y secos.

Bryoerythrophyllum campylocarpum (C. Müll.) Crum. *2188, 2892, 2893.* 2900-3050 m. Suelo, lugares sombreados o expuestos y secos.

B. inaequalifolium (Tayl.) Zand. *3185b.* Suelo lugares expuestos y secos.

B. jamesonii (Tayl.) Crum. *2175b, 2201b.* 3050 m. Tronco de *Quercus* o roca, lugares soleados y secos.

B. recurvirostrum (Hedw.) Chen. *2228, 2915a.* 2900-3050 m. Suelo, lugares soleados o expuestos y secos.

Bryohaplocladium microphyllum (Hedw.) Watanabe & Iwats. *2195.* 3050 m. Suelo, lugares sombreados y secos.

Bryum argenteum Hedw. *2212, 2913.* 2900 m. Suelo cubriendo roca, lugares expuestos o soleados y secos o mojados.

B. billardieri Schwaegr. *2169, 2220a.* 2600-3050 m. Suelo o base de tronco de *Quercus*, lugares sombreados y secos o húmedos.

B. chryseum Mitt. *2163b.* 2600 m. Suelo compactado en base de *Opuntia*, lugares sombreados y secos.

Campylium hispidulum (Brid.) Mitt. var. *sommerfeltii* (Myr.) Lindb. *2889.* 2900 m. Suelo, lugares expuestos y secos.

Ceratodon purpureus (Hedw.) Brid. ssp. *stenocarpus* (B.S.G.) Dix. *2902.* Sobre roca, lugares soleados y secos.

Desmatodon convolutus (Brid.) Grout. *2163a, 2912, 5195.* 2600-2900 m. Roca o suelo, lugares soleados, sombreados o expuestos y secos o mojados.

Didymodon australasiae (Hook. & Grev.) Zand. var. *australasiae. 2154b, 2895, 5191b.* 2400-3050 m. Suelo, lugares expuestos y secos o mojados.

D. incrassatolimbatus Card. *2210.* Suelo cubriendo roca, lugares expuestos y secos.

D. revolutus (Card.) Williams. *2155a, 2213, 2260.* 2400 m. Suelo cubriendo roca, lugares expuestos o soleados y secos o húmedos.

D. rigidulus Hedw. var. *icmadophilus* (Schimp. ex C. Müll.) Zand. *2166a, 2185a, 2206a.* 2400-3050 m. Suelo en base de compuesta o *Schinus*, lugares sombreados y secos.

D. rigidulus Hedw. var. *gracilis* (Scheleich. ex Hook. & Grev.) Zand. *2203a.* Suelo.

D. vinealis (Brid.) Zand. var. *luridus* (Hornsch.) Zand. *2215.* Suelo cubriendo roca, lugares sombreados y mojados.

Encalypta ciliata Hedw. *2900, 2905b*. 2890 m. Sobre suelo, lugares expuestos y secos.

Entodon beyrichii (Schwaegr.) C. Müll. *2227b*. 3050 m. Base de tronco de *Quercus*, lugares soleados y secos.

Fabronia ciliaris (Brid.) Brid. var. *ciliaris*. *2159b*. 2400 m. Rama de arbusto, lugares sombreados y secos.

F. ciliaris (Brid.) Brid. var. *wrightii* (Sull.) Buck. *2161*. 2400 m. Rama en descomposición de *Opuntia*, lugares sombreados y secos.

F. ciliaris (Brid.) Brid. var. *polycarpa* (Hook.) Buck. *2216, 2218b*. Rama de *Opuntia*, lugares sombreados y secos.

F. macroblepharis Schwaegr. *2223*. 3050 m. Base de tronco de *Opuntia*, lugares sombreados y secos.

Fissidens repandus Wils. *2162a, 2899*. 2400 m. Suelo, lugares sombreados o expuestos y húmedos.

Funaria hygrometrica Hedw. *2167*. 2600 m. Suelo en base de *Agave*, lugares sombreados y húmedos.

F. muhlenbergii Turn. *5194*. 2750 m. Suelo, lugares expuestos y mojados.

Grimmia affinis Hornsch. *2901*. 2900 m. Roca, lugares expuestos y secos.

G. pilifera P. Beauv. *2897*. 2900 m. Roca, lugares expuestos y secos.

G. trichophylla Grev. *Rzedowski 20056*. 3000 m. Roca.

Hedwigia ciliata (Hedw.) P. Beauv. *2249*. 3050 m. Roca, lugares expuestos y secos.

Hedwigidium integrifolium (P. Beauv.) Dix. *2201a*. 3050 m. Roca, lugares soleados y secos.

Homomallium mexicanum Card. *2904*. 2900 m. Roca, lugares soleados y secos.

Hypnum cupressiforme Hedw. var. *lacunosum* Brid. *2248*. 3050 m. Suelo, lugares expuestos y secos.

Leptopterigynandrum austro-alpinum C. Müll. *2242*. 3050 m. Roca, lugares sombreados y secos.

Leskea angustata Tayl. *2159a, 2233, 5186*. *Rzedowski 20055*. 2400-3050 m. Tronco o rama de *Cupressus*, lugares sombreados y mojados o secos.

Lindbergia mexicana (Besch.) Card. *2168, 2175a, 2205*. 2600-3050 m. Tronco de *Quercus*, base de *Opuntia* o tronco de *Schinus*, lugares sombreados o soleados y secos.

Molendoa sedtneriana (B.S.G.) Limpr. *2257, 2258*. 3050 m. Suelo cubriendo roca, lugares sombreados o soleados y secos.

Morinia crassicuspis (Robins.) Zand. *Rzedowski 20071b*. 3000 m.

Neckera chlorocaulis C. Müll. *2197*. 3050 m. Tronco de *Quercus*, lugares sombreados y secos.

Orthotrichum diaphanum Schrad. ex Brid. var. *diaphanum*. *2218a*. Rama de *Opuntia*, lugares sombreados y secos.

O. pycnophyllum Schimp. *2177, 2181, 4513*. *Rzedowski 20054*. 2950-3050 m. Sobre tronco o rama de *Quercus*, lugares sombreados o soleados y secos.

Oxystegus tenuirostris (Hook. & Tayl.) A.J. Smith. *2916, 5187*. 2900-2950 m. Suelo, lugares expuestos y secos o mojados.

Pleuridium sullivantii Aust. var. *mexicanum* (Card.) Cárde. *3186, 4506, 4515, Delgadillo 5018a*. 2950-2960 m. Sobre suelo compactado, lugares expuestos o sombreados y húmedos o mojados.

Pohlia oerstediana (C. Müll.) Shaw. *2896a*. 2900 m. Suelo, lugares expuestos y secos.

Pylaisiella falcata (B.S.G.) Ando. *2187, 2225, 4511.* 2950-3050 m. Base de tronco de *Quercus* u *Opuntia*, lugares expuestos o sombreados y secos.

Rhexophyllum subnigrum (Mitt.) Hilp. *2174, 2245, 5184, Rzedowski 20060.* 2950-3050 m. Roca o base de tronco de *Quercus*, lugares sombreados y mojados o secos.

Rhynchostegium pulchellum (Hedw.) Robins. *2890, 2896b.* 2900 m. Suelo, lugares expuestos y secos.

R. saint-pierrei Thér. *2891.* 2900 m. Suelo, lugares expuestos y secos.

Timmiella anomala (B.S.G.) Limpr. *2898.* Suelo, lugares sombreados y secos.

Tortula amphidiacea (C. Müll.) Broth. *2232a.* 3050 m. Rama de *Cupressus*, lugares sombreados y secos.

T. aurea Bartr. *2149.* 2400 m. Suelo compactado, lugares expuestos y secos.

T. fragilis Tayl. *2211, 2224, 5185.* 2950-3050 m. Tronco de *Quercus*, suelo o roca, lugares expuestos o sombreados y secos o mojados.

T. obtusissima (C. Müll.) Mitt. *2238.* 3050 m. Suelo, lugares soleados y secos.

T. pagorum (Milde) De Not. *2159c.* 2400 m. Rama de arbusto, lugares sombreados y secos.

Trichostomum brachydontium Bruch. *2170, 2250, 5193.* 2600-3050 m. Suelo, lugares expuestos o sombreados y secos o mojados.

Zygodon ehrenbergii C. Müll. *2226.* 3050 m. Tronco de *Quercus*, lugares sombredos y seco.

Z. liebmanii Schimp. ex C. Müll. *2231.* 3050 m. Tronco de *Cupressus*, lugares sombreados y secos.

Agradecimientos. Al Dr. Claudio Delgadillo por la revisión crítica del manuscrito y su apoyo en el trabajo de campo; a la Srita. Bernardina Bello, por su ayuda en la elaboración del listado.

Literatura Citada

Cárdenas S., A. 1988. Los musgos cleistocárpicos del Valle de México, México. *Bryologist* 91: 214-216.

Cárdenas S., A. & C. Delgadillo M. 1992. Los musgos de la Sierra de Alcaparrosa, México. *Acta Bot. Mex.* 17: 23-33.

Castilla H., M. & D. Tejero. 1987. Flora y Vegetación del Cerro Gordo (San Juan Teotihuacán) y regiones aledañas, Valle de México, México. *Biótica* 12: 231-255.

Mosser, F. 1975. Histoira geológica de la Cuenca de México. In: *Memoria de las obras del Sistema de Drenaje Profundo del Distrito Federal*. Departamento del Distrito Federal, México. Vol. I: 7-38.

Rzedowski, J., G. Guzmán, A. Hernández & R. Muñíz. 1964. Cartografía de los principales tipos de vegetación de la mitad septentrional del Valle de México. *An. Esc. Nac. Cienc. Biol., Méx.* 13: 31-57.

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The Bryophytes of Vermont

Cyrus B. McQueen [1]

The bryophytes make up a significant portion of the flora of Vermont. Over the past several years I have personally examined over 5000 herbarium specimens, collected between 1870 and 1991, from the Pringle Herbarium (VT) at the University of Vermont and the New York Botanical Garden (NY). Based upon these specimens, there are 519 taxa of bryophytes in Vermont. This includes 3 species of Anthocerotae; 149 species, 7 subspecies, 5 varieties, and 2 forms of Hepaticae; and 344 species and 9 varieties of Musci. Reliable literature reports from Schuster (1966-1980), Howard (1975), Ireland (1982), and Crum & Anderson (1981) are included in the list. In compiling this checklist I used Schuster (1953, 1966-1980) and Stotler & Crandall-Stotler (1977) for the Anthocerotae and Hepaticae. For the Musci I used Anderson et al. (1990), Anderson (1990), Andrus (1980), Crum & Anderson (1981), Crum (1984), Howard (1975), and Ireland (1982).

This is the first complete checklist of all bryophytes for Vermont. I previously published checklists of Vermont liverworts (McQueen 1986) and *Sphagnum* (McQueen 1985). The most recent checklist of mosses for the state was published by Grout & Dole (1932). They reported the there were 332 species and 51 varieties of mosses. The first purported complete checklist of mosses for the state was published by Frost (1873) who reported 173 species and 2 varieties. Grout (1898) published a checklist with analytical keys and reported that there were 258 species and 15 varieties. Andrews (1906) published the first checklist of *Sphagnum* for the region and reported 38 species and 14 varieties. A more complete history of bryology in the state is discussed by Grout & Dole (1932).

There are no endemic species of bryophytes in Vermont. Most of the species are common to the continental regions of northeastern North America. Some of the floristic elements of the regions are similar to those of the Maritime Provinces with the exception of the oceanic and coastal plain elements (Ireland 1982).

Physical Features. Although Vermont is one of the smallest states, it has a diverse physiography. The northern border with Canada is at the 45th parallel, the southern border with Massachusetts is at 42° 45' N, the Connecticut River forms the eastern boundary with New Hampshire, and Lake Champlain forms the major boundary with New York. The annual average temperature varies from 21-25° C, with average minimum temperatures of -5° C or less. Average annual precipitation varies within the state from 76-127 cm.

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Six physiographic regions (Figure 1) are recognized in the state of Vermont (Jacobs 1963, Johnson 1984). The **Green Mountains (GM)** are the dominant feature of the state. This portion of the Appalachian Mountain system extends about 160 miles through the central portion of the state. The width is fairly uniform with a width of 21 miles at the Canadian border in the north and 36 miles at the Massachusetts border in the south. The highest peak of the Green Mountains is Mt. Mansfield (4,393 feet) in the north central portion of the range with numerous peaks over 3,000 feet. Schists comprise the most abundant bedrock type followed by igneous deposits on the eastern slopes of the Green Mountains. Some serpentine deposits are found in the northern portion of the range. **The Taconic Mountains (TM)** in the southwestern portion of the state extend for 75 miles along the border with New York. The Taconic Mountains are composed of shales and slates overlain on older limestone deposits which are also found in this region. The **Vermont Valley (VV)** is a narrow valley bordered on the west by the Taconic Mountains and on the east by the Green Mountains. This valley extends for 85 miles and varies in width from several hundred yards to as much as 8 miles. Limestone and marble form the bedrock of the Vermont Valley. This region consists of primarily open farmland due to its flatness and the fertility of the soil.

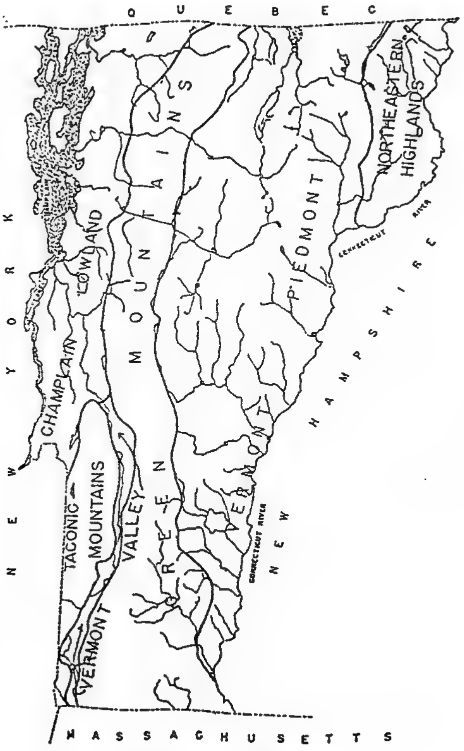

Figure 1. Vermont

The **Champlain Lowland (CL)** drains into Lake Champlain. This region on the western border of Vermont is about 109 miles in length and varies from 5 to 20 miles in width. Lake Champlain is the sixth largest natural lake in the United States and one of the deepest (>600 feet). Limestone comprises most of the bedrock in the region. Open farmlands and many wetlands adjoining Lake Champlain characterize the habitat of the region. This region has a much milder climate than the others due to the moderating effect of Lake Champlain and to the protection offered by the Adirondack Mountains on the west, the Taconic Mountains in the south, and the Green Mountains on the east.

The **Vermont Piedmont (VP)** extends along most of the eastern border of the Green Mountains. The dominant bedrock of the region consists of mixtures of granite and schist, but there are limestone deposits in the northeastern portion of the region. The climate of this region is milder than the Green Mountains due in part to its location on the lee side of the Green Mountains and its lower elevation. The **Northeastern highlands** (NE) comprises over 600 square miles in the northeastern portion of the state. Most of the region is underlain with granite which is primarily covered with thick glacial deposits of gravel and sand. Forested wetlands are common throughout this region. The northern location accounts for its severe climate which is very similar to that of the Green Mountains.

Biogeography. The mountainous regions of the state include an Artic-Alpine Element that includes species such as:

Catoscopium nigritum (Hedw.) Brid.
Isopterygiopsis pulchella (Hedw.) Iwats.
Myurella julacea (Schwaegr.) B.S.G.
Palludella squarrosa (Hedw.) Brid.
Polytrichastrum alpinum (Hedw.) Sm.

The Boreal Element which again includes most of the mountainous regions of the state includes species such as:

Abietinella abietna (Hedw.) Fleisch.
Andreaea rupestris Hedw.
Calliergon stramineum (Brid.) Kindb.
Cratoneuron filicinum (Hedw.) Spruce
Dicranum polysetum Sw.
Distichum capillaceum (Hedw.) B.S.G.
Ditrichum flexicaule (Schwaegr.) Hampe
Grimmia affinis Hoppe & Hornsch.
Helodium blandowii (Web. & Mohr) Warnst.
Herzogiella striatella (Brid.) Iwats.
Hylocomium splendens (Hedw.) B.S.G.
Leskeela nervosa (Brid.) Loeske
Mnium spinulosum (Voit) Schwaegr.
Mnium stellare Hedw.
Plagiothecium laetum B.S.G.
Pleurozium schreberi (Brid.) Mitt.
Polytrichum strictum Brid.
Ptilium crista-castrensis (Hedw.) De Not.
Rhytidium rugosum (Hedw.) Kindb.
Rhytidiadelphus triquetrus (Hedw.) Warnst.
Scorpidium scorpioides (Hedw.) Limpr.
Sphagnum fuscum (Schimp.) Klinggr.
Sphagnum capillifolium (Ehrh.) Hedw.
Sphagnum squarrosum Crome
Sphagnum wulfianum Girg.
Splachnum ampullaceum Hedw.
Tetraplodon mnioides (Hedw.) B.S.G.
Tomenthypnum nitens (Hedw.) Loeske.

The Temperate Element that occurs throughout the state includes:

Anomodon attenuatus (Hedw.) Hub.
Anomodon rostratus (Hedw.) Schimp.
Atrichum undulatum (Hedw.) P. Beauv.
Barbula unguiculata Hedw.
Brachythecium acuminatum (Hedw.) Aust.
Dicranum flagellare Hedw.
Homomallium adnatum (Hedw.) Broth.
Hypnum curvifolium Hedw.
Hypnum imponens Hedw.
Myurella sibirica (C. Mull.) Reim.
Neckera pennata Hedw.
Orthotrichum ohioense Sull. & Lesq.
Orthotrichum stellatum Brid.
Philonotis marchica (Hedw.) Brid.
Plagiomnium ciliare (C. Mull.) T. Kop.
Plagiomnium cuspidatum Hedw.
Taxiphyllum deplanatum (B.S.G.) Fleisch.
Thuidium delicatulum (Hedw.) B.S.G.
Weissia controversa Hedw.

The Cosmopolitan Element includes species that occur in disturbed habitats throughout the world such as:

Bryum argenteum Hedw.
Ceratodon purpureus (Hedw.) Brid.
Funaria hygrometrica Hedw.
Leptobryum pyriforme (Hedw.) Wils.

The Vermont flora has several rare species. Only two bryophytes are currently protected by the State as rare and endangered species. The best known of these is *Plagiobryum zierii* (Hedw.) Lindb. This species has only been collected in Smuggler's Notch and near St. Anne des Monts River, Gaspe in eastern North America. *Sphagnum subfulvum* Sjors has been collected from three sites in Vermont, but at the present time is found only at Shelburne Pond. This species is more typical of more northern coastal floras. *Buxbaumia minakatae* Okam. has been collected from Brandon and Lake Willoughby, but is regarded as a globally rare species (Crum & Anderson 1981). *Tayloria serrata* (Hedw.) B.S.G. which grows on moose dung is considered an arctic alpine species and is rare in eastern North America. *Splachnum ampullaceum* Hedw. is another dung colonizing species that is considered to be rare. *Cyrtomnium hymenophyllum* (B.S.G.) Holm. is an extremely rare artic to subarctic species that is found on the cliffs of Lake Willoughby. *Meesia triquetra* (L.) Angstr. is an arctic species that is rarely found in southern Canada and the United States. Likewise, *Bryum pallens* (Brid.) Sw., a species with a more northern circumboreal distribution is rare in eastern North America. *Anomobryum filiforme* (Dicks.) Rabenh. is not common in eastern North America, but appears to be widely scattered throughout the circumboreal regions.

Much less is known of the distribution of liverworts, but some rare species have been collected from Vermont. *Cephaloziella massaalongi* (Spr.) K. Mull., *Cephaloziella stellulifera* (Tayl.) Schiffn., and *Scapania umbrosa* (Schrad.) Dumort. are listed by Schuster (1966-1980) as being rare and found only in the southern edges of the Spruce-Fir Forest region and the northern edges of the Deciduous Forest zone in eastern North America.

Vermont has been undercollected for bryophytes over the past century. Sites such as Mt. Mansfield (GM), Camel's Hump (GM), Lake Willoughby (VP), Quechee Gorge (VP), Colchester Bog (CL), Leicester Swamp (CL), Burlington (CL), Middletown Springs (TM), Manchester (VV), and Rutland (VV) have received the greatest the greatest attention from collectors. In addition, the bryophyte flora of the town of Newfane (GM) in southern Vermont is well documented because it was the birthplace and home of Aaron J. Grout. These sites represent all of the physiographic regions except for the Northeastern Highland. In spite of Dr. Grout's interest in Vermont, he only collected the few sites frequented by other botanists. As a result, the state has not been thoroughly investigated for bryophytes.

In spite of this, the present checklist indicates that Vermont has a very rich bryophyte flora. New species will undoubtedly be added in the future. I believe that the Northeastern Highlands, which contains extensive wetland habitats favorable for bryophytes, will yield many new sites and species for the bryophytes of eastern North America. Based upon ranges and habitats listed for species by Crum & Anderson (1981), Ireland (1982), and Schuster (1966-1980), there are at least 79 additional species, whose ranges include Vermont, that may yet be found. Of particular interest are species in the genera of *Splachnum*, *Tetraplodon*, and *Tayloria* which are often referred to as the dung mosses because many of the species are only found on the dung of large mammals such as moose and coyote. With the increase in the moose population in Vermont over the past decade it is certain that these species may soon find their way into Vermont.

Specimens examined and cited. To conserve space I have only listed one specimen for each physiographic region in which a species has been collected. Abbreviations are used for the physiographic regions, references are cited for that are based on literature reports, and NAMP = Grout's North American Musci Perfecti. The list is based upon specimens that I have examined from the Pringle Herbarium at the University of Vermont and the New York Botanical Garden. I have examined collections from other herbaria in New England, but most contain duplicates of specimens at the Pringle Herbarium (VT) and the New York Botanical Garden (NY) or repetitive collections from the most frequently collected sites that I mentioned above. All specimens are in VT unless otherwise indicated. All species are based on specimens that I have personally examined with the exception of a few for which I believe are reliable reports from the literature. The nomenclature follows Stotler & Crandall-Stotler (1977) for hepatics, Anderson et al. (1990) for mosses excluding *Sphagnum*, and Anderson (1990) for *Sphagnum* with some exceptions where I disagree with these authors.

Alphabetic List of Anthocerotae

Anthoceros (Anthocerotaceae)
    punctatus L.: CL, Dutton 1894.
Notothylas (Anthocerotaceae)
    orbiculatus (Schwein.) Sull.: CL, Dutton 1872.
Phaeoceros (Anthocerotaceae)
    laevis (L.) Prosk.: CL, Flynn 1912.

Alphabetic List of Hepaticae

Anastrophyllum (Lophoziaceae)
  hellerianum (Nees) Schust.: GM, Dobbin; VP, Faxon.
  michauxii (Web.) Buch & Evans: GM Pringle 1880.
  minutum (Schreb.) Schust.: CL, Dutton 1284.
  saxicolus (Schrad.) Schust.: GM, Pringle.
Aneuria (Aneruaceae)
  pinguis (L.) Dum.: CL, Dutton 1918.
Apometzgeria (Metzgeriaceae)
  pubescens (Schwank.) Kuwah.: CL, Dutton 840; GM, Dobbin 101.
Asterella (Aytoniaceae)
  tenella (L.) P. Beauv.: CL, Evans 1270.
Athalamia (Cleveaceae)
  hyalina (Sommert.) Hatt.: VP, Lorenz 1913.
Barbilophozia (Lophoziaceae)
  attenuata (Mart.) Loeske: GM, Dutton 1674.
  barbata (Schmid.) Loeske: VV, Dutton 124; CL, Hoisington BR-498; GM, Dutton 1913.
Bazzania (Lepidoziaceae)
  denudata (Torrey) Trev.: CL, Dutton 2193; VP, Lorenz; VV, Dutton 2526; GM, Dutton 2208.
  tricrenata (Wahl.) Trev.: GM, Pringle 308; CL, Dutton 1577.
  trilobata (L.) S.F. Gray: GM, Rooks 76-43; CL, Dutton 2193.
Blasia (Blasiaceae)
  pusilla (L.) Micheli: GM, Rooks 75-27; CL, Flynn 1911.
Blepharostoma (Pseudolepicoleaceae)
  trichophyllum (L.) Dum.: CL, Rooks 76-422; GM, Hoisington BR-517.
Calypogeja (Calypogeiaceae)
  fissa (L.) Raddi: CL, Dutton 1621.
  fissa subsp. *neogaea* Schust.: TM, Rooks 76-364; GM, Schuster 43,818 (NY).
  integristipula Steph.: CL, Dutton 2246.
  muelleriana (Schiffn.) K. Mull.: GM, Schoch 40; VP, Hoisington BR-479.
  neesiana (Mass. & Card.) K. Mull.: CL, Dutton 2246; GM, Schuster 43,837 (NY).
  sphagnicola (Arn. & Perss.) Warnst. & Loeske: VP, Lorenz; GM, Dutton.
  suecica (Arn. & Perss.) K. Mull.: VP, Lorenz 375; GM, Schuster 43,823 NY).
  trichomanis (L.) Corda: CL, Howe 49; GM, Howe 18.
Cephalozia (Cephaloziaceae)
  bicuspidata (L.) Dum.: GM, Dutton 59; CL, Hoisington BR-469.
  bicuspidata subsp. *ambigua* (Massal.) Schust.: CL, Dutton 902.
  catenulata (Huben.) Lindb.: CL, Pringle 1880.
  connivens (Dicks.) Lindb.: TM, Dutton 2484; CL, Dutton 2508.
  fluitans (Nees) Spruce: CL, Dutton 1888.
  leucantha Spr.: GM, Schuster 43,823 (NY).
  lunulifolia (Dum.) Dum.: VV, Rooks 76-412; CL, Dutton 1590; GM, Dutton 2483.

macrostachya Kaal.: GM, Lorenz 1916.
pleniceps (Aust.) Lindb.: VP, Lorenz 1910; CL, Dutton 2087.

Cephaloziella (Cephaloziellaceae)
arctica Bryhn & Douin: GM, Schuster 74-2006a (NY).
bysssacea (Roth) Warnst.: GM, Rooks 75-25; CL, Evans; VP, Evans.
elachista (Jack) Schiffn.: VP, Lorenz 779 (NY); GM, Schuster 74-2061 (NY).
hampeana (Nees) Schiffn.: CL, Evans; VP, Lorenz 1913.
massalongi (Spr.) K. Mull.: GM, Schuster 74-2170.
rubella (Nees) Warnst.: GM, Dutton; VP, Lorenz 390.
rubella var. *elegans* (Heeg) Schust.: GM, Schuster 74-2070 (NY).
stellulifera (Tayl.) Schiffn.: VP, Schuster 46,211.

Chandonanthus (Jungermanniaceae)
setiformis (Ehrh.) Lindb.: GM, Dutton 1641.

Chioscyphus (Geocalycaceae)
pallescens (Ehrh.) Dum.: VP, Lorenz 1914; GM, Dobbin 1912; CL, Shuster (1980).
pallescens var. *fragilis* (Roth) K. Mull.: CL, Dutton.
polyanthos (L.) Corda: CL, Dutton 436; GM, Dutton 1997.
polyanthus var. *rivularis* (Schrad.) Nees: GM, Grout; CL, Evans.

Cladopodiella (Cephaloziaceae)
fluitans (Nees) Joerg.: CL, Lorenz 1912.

Cololejeunea Calypogeiaceae)
biddlecomiae (Aust.) Evans: CL, Dutton 343; GM, Grout.

Conocephalum (Conocephalaceae)
conicum (L.) Lindb.: GM, Seymour 28,646; CL, Pomphrey 15; VP, Hoisington BR-112; VV, Flynn 1899.

Diplophyllum (Scapaniaceae)
apiculatum (Evans) Steph.: GM, Schoch 43.
taxifolium (Wahl.) Dum.: GM, Dutton 1748.

Fossombronia (Codoniaceae)
foveolata Lindb.: CL, Dutton 1130.

Frullania (Frullaniaceae)
eboracensis Gott.: GM, Pringle 169; CL, Dutton 110.
riparia Hampe: VV, Andrews 1901; CL, Dutton 1911.
selwyniana Pears.: VP, Lorenz 1913.
squarrosa (Reinw., Blume, & Nees) Dum.: GM, Hoisington BR-403.
tamarisce subsp. *asagrayana* (Mont.) Hatt.: GM, Dutton 2253; CL, Pringle 1877.
virginica Gott.: GM, Pringle 1880; CL, Dutton 100.

Geocalyx (Geocalycaceae)
graveolans (Schrad.) Nees: TM, Dutton 2487; CL, Dutton 2487.

Gymnocolea (Lophoziaceae)
inflata (Huds.) Dum.: GM, Weber B2938; CL, Dutton 46.

Gymnomitrion (Gymnomitriaceae)
concinnatum (Lightf.) Corda: GM, Schuster (1974).

Harpanthus (Geocalycaceae)
  drummondii (Tayl.) Grolle: VV, Howe 1908; GM, Schuster 74-2026 (NY).
  scutatus (Web. & Mohr) Spr.: GM, Dutton 635; VV, Dutton 889.
Jamesoniella (Jungermanniaceae)
  autumnalis (DC) Steph.: GM, Dutton 2285; CL, Pringle 106.
Jubula (Jubulaceae)
  pennsylvanica (Steph.) Evans: GM, Dobbin 1912.
Jungermannia (Jungermanniaceae)
  exsertifolia subsp. *cordifolia* (Dum.) Vana: CL, Lorenz 1923.
  gracillima Sm.: CL, Dutton 1971.
  hyalina Lyell: VP, Lorenz 1910; CL, Dutton 726.
  lanceolata L.: VP, Andrews 1901; GM, Grout 1909.
Kurzia (Lepidoziaceae)
  setacea (Web.) Grolle: CL, Dutton 1256.
Lejeunea (Lejeuneaceae)
  cavifolia (Ehrh.) Lindb.: No location given, Lorenz 1913.
  lamacerina subsp. *gemminata* Schust.: CL, Howe 1898.
Lepidozia (Lepidoziaceae)
  reptans (L.) Dum.: GM, Zomlefer 133; VP, Hoisington 92; CL, Dutton 2184.
Lophocolea (Geocalycaceae)
  bidentata (L.) Dum.: GM, Howe 34; CL, Howe 71.
  heterophylla (Schrad.) Dum.: GM, Rooks 76-20; CL, Hoisington BR-468.
  minor Nees: GM, Howe 14; CL, Pringle.
Lophozia (Lophoziaceae)
  alpestris (Schleich.) Evans: GM, Schuster 43,812 (NY).
  ascendens (Warnst.) Schust.: GM, Schuster 43,823 (NY).
  attenuata (Mart.) Dum.: GM, Rooks 76-34.
  badenses (Gott.) Schiffn.: VP, Lorenz 1910.
  barbata (Schmid.) Dum.: VV, Dutton 2526; CL, Dutton 1385.
  bicrenata (Schmid.) Dum.: GM, Schuster 43,813 (NY).
  capitata (Hook.) Boulay: CL, Evans.
  collaris Schust.: GM, Schuster 46,204 (NY).
  excisa (Dicks.) Dum.: CL, Dutton.
  floerkei (Web. & Mohr) Schiffn.: GM, Lorenz 1917.
  gillmani (Aust.) Schust.: VP, Lorenz 1910; GM, Schuster 661,854 (NY).
  graniretis (Lindb.) Schiffn.: VP, Lorenz 1914.
  hatcheri (Evans) Steph.: GM, Schuster (1969).
  heterocolpa (Thed.) Howe: VP, Lorenz 1915; GM, Schuster 661,853 (NY).
  incisa (Schrad.) Dum.: VP, Dutton 2211; CL, Dutton 538; GM, Lorenz.
  longidens (Lindb.) Macoun: VP, Lorenz 1915; GM, Lorenz 1917.
  marchica (Nees) Steph.: CL, Lorenz 1908.
  porphyroleuca (Nees) Schiffn.: CL, Rooks 76-76; GM, Dobbin 1912.
  ventricosa (Dicks.) Dum.: GM, Rooks 76-382.

ventricosa var. *silvicola* (Buch) Jones: GM, Schuster 43,814 (NY).

Lunularia (Lunulariaceae)

cruciata (L.) Dum.: CL, Howe 76.

Mannia (Aytoniaceae)

fragrans (Balbis) Frye & Clark: CL, Jones 1897.

triandra (Scop.) Grolle: CL, Dutton 1631.

Marchantia (Marchantiaceae)

polymorpha L.: CL, Hoisington 1975; VP, Gates 151; VV, Flynn 1911; GM, Dutton 1786.

Marsupella (Gymnomitriaceae)

emarginata (Ehrh.) Dum.: GM, Alexander 10.

emarginata subsp. *tubulosa* (Steph.) Kitag. var. *latifoba* Schust.: GM, Schuster 43,803 (NY).

sphacelata (Gies.) Dum.: GM, Lorenz 1917.

sphacelata fo. *bifida* Schust.: GM, Schuster 43,850 (NY).

sphacelata fo. *media* (Gott.) Schust.: GM, Schuster 43,843 (NY).

ustulata (Huben.) Spr.: GM, Schuster (1974).

Metzgeria (Metzgeriaceae)

conjugata Lindb.: CL, Howe 111; GM, Pringle 1880.

furcata (L.) Dum.: CL, Dutton 1910; VP, Dutton 425; GM, Dutton 947.

pubescens (Schrank) Raddi: CL, Dutton 840.

Microlepidozia (Lepidoziaceae)

setacea (Web.) Joerg.: CL, Dutton 1256.

Moerckia (Pallaviciniaceae)

hibernica (Hook.) Gott.: VP, Lorenz 1914.

Mylia (Jungermanniaceae)

anomala (Hook.) S.F. Gray: CL, Dutton 2190.

taylorii (Hook.) S.F. Gray: GM, Rooks 76-62.

Nardia (Jungermanniaceae)

scalaris (Schrad.) S.F. Gray: GM, Schoch 27.

Nowellia (Cephaloziaceae)

curvifolia (Dicks.) Mitt.: GM, Rooks 76-138; CL, Pringle 390.

Odontoschisma (Cephaloziaceae)

denudatum (Nees) Dum.: GM, CL, Schuster (1974).

Pallavicinia (Pallaviciniaceae)

lyellii (Hook.) Carruth.: GM, Dutton 1849.

Pellia (Pelliaceae)

endiviifolia (Dicks.) Dum.: VP, Lorenz 1910.

epiphylla (L.) Corda: GM, Losure 70; CL, Rooks 76-245.

Plagiochila (Plagiochilaceae)

asplenioides (L.) Dum.: CL, Alexander 7; GM, Spencer 130; VV, Dutton 1502.

asplenioides subsp. *porelloides* (Torrey) Schust.: Schuster (1980).

austini Evans: CL, Dutton 1285; GM, Wynne 1928.

porelloides (Torrey) Lindenb.: TM, Howe 20; CL, Dutton 841; GM, Dutton 2502.

Porella (Porellaceae)
  pinnata L.: CL, Dutton 2479.
  platyphylla (L.) Pfeiff.: CL, Zomlefer 154; GM, Dutton 2196.
  platyphylloidea (Schwein.) Lindb.: GM, Rooks 75-15; CL, Spencer 110.
Pressia (Marchantiaceae)
  quadrata (Scop.) Nees: CL, Rooks 75-48; GM, Howe 2; VP, Flynn 1920.
Ptilidium (Ptilidiaceae)
  ciliare (L.) Hampe: GM, Rooks 76-343; CL, Pringle 132.
  pulcherrimum (Web.) Hampe: GM, Rooks 76-38; CL, Dutton 1446.
Radula (Radulaceae)
  complanata (L.) Dum.: GM, Rooks 75-10; CL, Pringle 117.
  obconica Sull.: CL, Dutton 1377.
  tenax Lindb.: CL, Dutton 1377.
Reboulia (Aytoniaceae)
  hemisphaerica (L.) Raddi: CL, Pringle 1877.
Riccardia (Aneuraceae)
  latifrons Lindb.: CL, Dutton 1588.
  multifida (L.) S. Gray: VP, Lorenz 1914.
Riccia (Ricciaceae)
  fluitans L.: TM, Dutton 637; CL, Dutton 2051.
Ricciocarpus (Ricciaceae)
  natans (L.) Corda: TM, Dutton 217; VP, Darling 1924; CL, Dutton 1259.
Scapania (Scapaniaceae)
  curta (Mart.) Dum.: GM, Dutton 640.
  cuspiduligera (Nees) K. Mull.: GM, Schuster 66-1853a (NY).
  dentata Dumort.: GM, Dutton 2407.
  glaucocephala (Tayl.) Aust.: TM, Schuster (1974).
  gymnostomophila Kaal.: VP, Lorenz 1915; GM, Lorenz.
  irrigua (Nees) Dum.: CL, Schuster (1974).
  lingulata Buch: VP, Schuster 46,205 (NY).
  mucronata Buch: Schuster (1974).
  nemorosa (L.) Dum.: VV, Dutton 2437; CL, Pringle 386; GM, Dutton 19.
  paludicola Loeske & K. Mull.: VP, Lorenz 1915.
  paludosa (K. Mull.) K. Mull.: GM, Evans.
  umbrosa (Schrad.) Dum.: VP, McQueen 1990.
  undulata (L.) Dum.: VV, Rooks 76-383; GM, Howe 10.
  undulata var. *oakesii* (Aust.) Buch: GM, Dutton 78.
Solenostoma (Jungermanniaceae)
  caespiticium (Lindb.) Steph.: CL, Spencer 101.
  cordifolium (Hook.) Steph.: VP, Lorenz 1921.
  gracillimum (Smith) Schust.: CL, Dutton 1971 : GM, Grout.
  hyalinum (Lyell) Mitt.: GM, VP, CL, Schuster (1969).
  obovatum (Neees) Schust.: GM, Schuster (1969).

obscurum (Evans) Schust.: VV, Grout.
pumilum (With.) K. Mull.: CL, Schuster (1969).
sphaerocarpum (Hook.) Steph.: GM, Schuster 66-1853 (NY).
Trichocolea (Trichocoleaceae)
tomentella (Ehrh.) Dum.: CL, Grout 1896; GM, Howe 3; VP, Hoisington BR-523.
Tritomaria (Lophoziaceae)
exsecta (Schmid.) Schiffn.: GM, Dutton 157 : VP, Schuster 46,213.
exsectiformis (Breidl.) Schiffn.: GM, Cutton 2210; CL, Schuster (1969).
quinquedentata (Huds.) Buch: CL, Evans 1913; GM, Schuster 43,806 (NY).

Alphabetic List of Musci

Abietinella (Thuidiaceae)
abietina (Hedw.) Fleisch.: CL, Schoch 37; VP, Faxon VIII.1883 (NY); GM, Carpenter 1935.
Amblystegium (Amblystegiaceae)
serpens (Hedw.) B.S.G.: CL Dutton 91; GM, Rooks 76-21.
serpens var. *juratzkanum* (Schimp.) Rau. & Herv.: CL, Ragan 37.
varium (Hedw.) Lindb.: GM, McQueen 74; VV, Frost (NY); CL, Pringle 196.
Amphidium (Orthotrichaceae)
lapponicum (Hedw.) Schimp.: GM, Pringle (NY).
Anacamptodon (Fabroniaceae)
splachnoides (Fröl.) Brid.: TM, Dutton 1912; GM, McQueen 225; VP, McQueen 187.
Andreaea (Andreaeaceae)
rothii Web. & Mohr.: CL, Dutton 824; VP, Dutton 1341; GM, Dutton 1722.
rupestris Hedw.: GM, Rooks 76-185; VP, Dutton 1410.
Anomobryum (Bryaceae)
filaforme (Dicks.) Solms: GM, Pringle 2.X.1880.
Anomodon (Anomodontaceae)
attennatus (Hedw.) Hub.: GM, Grout M1; TM, Dutton 1911; CL, Zomlefer 152.
minor (Hedw.) Furnr.: TM, Dutton 25.VI.1910; GM, Sullivan 207; CL, Losure 127.
rostratus (Hedw.) Schimp.: VP, Faxon 23.VI.1884 (NY); CL, Rooks 75-30; GM, McQueen 141.
rugelii (C.Mull.) Keissl.: CL, Pringle 124; TM, Rooks 76-468; GM, Dobbin 3.IV.1910.
viticulosus (Hedw.) Hook. & Tayl.: VP, Pringle 1888 (NY); GM, Dutton 1912; TM, Grout 1931 (NY); CL, Losure 126.
Archidium (Archidiaceae)
alternifolium (Hedw.) Schimp.: CL, Dutton 1922.
Atrichum (Polytrichaceae)
angustatum (Brid.) B.S.G.: CL, Charette 740; GM, McQueen 55.
crispum (James) Sull.: CL, Schoch 10 : VP, McQueen 1979; GM, McQueen 222.
undulatum (Hedw.) P. Beauv.: VM, Grout M17; GM, Rooks 76-240; TM, Flynn; CL, Pumphrey 2.
Aulacomnium (Aulacomniaceae)
heterostichum (Hedw.) B.S.G.: VV, Carpenter 23; TM, Carpenter 1933;

CL, Dobbin 10.V.1933; VP, Frost.

palustre (Hedw.) Schwaegr.: GM, Pringle 324 (NY); CL, Grout M21; VP, Frost; VV, Kirk 20.VI.1910.

Barbula (Pottiaceae)

convoluta Hedw.: VP, Frost.

unguiculata Hedw.: VV, Kirk; CL, Dutton 681; VP,Frost; GM, McQueen 138.

Bartramia (Bartramiaceae)

pomiformis Hedw.: VP, Faxon 26.VI.1884 (NY); VV, Grout M31; TM, Flynn 1924; CL, McQueen 142; GM, McQueen 157.

Blindia (Seligeriaceae)

acuta (Hedw.) B.S.G.: VP, Faxon 23.VIII.1884 (NY); VV, Dobbin 1907; GM, Dutton 767.

Brachythecium (Brachytheciaceae)

acuminatum (Hedw.) Aust.: CL, Dutton.

calcareum Kindb.: VV, Dutton.

campestre (C. Mull.) B.S.G.: CL, Grout M434.

digastrum C. Muell. & Kindb.: CL, Johnson.

oedipodium (Mitt.) Jaeg.: GM, Grout M617.

oxycladon (Brid.) Jaeg.: CL, Pringle 94; VV, Rooks 76-394; GM, Dutton 899; VP, McQueen 179.

plumosum (Hedw.) B.S.G.: CL, Pringle 90 (NY); GM, Pringle 11; VP, Frost.

populeum (Hedw.) B.S.G.: GM, NAMP 38 (NY); VP, McQueen.

reflexum (Starke) B.S.G.: VV, NAMP 202 (NY); VP, Faxon 25.VI.1884; GM, McQueen 31.

rivulare B.S.G.: GM, Carpenter; VP, Blanchard; CL, Dutton 1473.

rutabulum (Hedw.) B.S.G.: TM, Carpenter; CL, Pringle P95; GM, McQueen 56.

salebrosum (Web. & Mohr.) B.S.G.: VV, Dutton; GM, Mann 33; VP, Blanchard M220; CL, Spencer 106.

turgidum (Hartm.) Kindb.: CL, Dutton 1630 (NY); VP, McQueen 218.

velutinum (Hedw.) B.S.G.: CL, Dutton 911; VP, Frost 1860; GM, McQueen 40.

Brotherella (Sematophyllaceae)

recurvans (Michx.) Fleisch.: CL, Pringle 101; VP, Faxon; GM, McQueen 66.

Bruchia (Bruchiaceae)

flexuosa (Sw.) C. Mull.: CL, Pringle.

Bryhnia (Brachytheciaceae)

graminicolor (Brid.) Grout: CL, Grout 13; VP, Dutton 423; GM, Dutton 432.

novae-angliae (Sull. & Lesq.) Grout: GM, NAMP 20a (NY); TM, Carpenter; VP, Faxon; CL, Dutton 751.

Bryoandersonia (Brachytheciaceae)

illecebra (Hedw.) Robins.: CL, Frost 1153; VP, Frost.

Bryoerthrophyllum (Pottiaceae)

recurvirostre (Hedw.) Chen: GM, Pringle 466; VP, Faxon 11; TM, Dutton 2485.

Bryohaplocladium (Leskeaceae)

microphyllum (Hedw.) Wat. & Iwats.: GM, Grout 1903; CL, Pringle 1880.

Bryum (Bryaceae)
  argenteum Hedw.: VP, Blanchard M51; CL, Pumphrey 4; VV, Kirk; GM, McQueen 21.
  caespiticium Hedw.: VP, Blanchard; CL, Flynn; GM, McQueen 18.
  capillare Hedw.: CL, Dutton 1252; GM, Dutton 696 VP, Frost.
  dichotomum Hedw.: GM, McQueen 30
  lisae var. *cuspidatum* (B.S.G.) Marg.: GM, Eaton; McQueen 133.
  pallens (Brid.) Sw.: TM, Carpenter 12; VP, Carpenter.
  pallescens Schleich.: GM, Carpenter.
  pseudotriquetrum (Hedw.) Gaertn, Meyer, & Scherb.: GM, Carpenter; CL, Dutton 722; TM, Flynn 24; VP, Frost 1371.
  weigleii Spreng.: VP, Grout (NY); GM, Dutton; CL, Dutton 1246.
Buxbaumia (Buxbaumiaceae)
  aphylla Hedw.: CL, Merse,; VP, Frost; GM, McQueen 1978.
  minakatae Okam.: CL, Dutton; VP
Callicladium (Hypnaceae)
  haldanianum (Grev.) Crum: CL, Stone 11; TM, Carpenter; VP, Frost; GM, McQueen 200.
Calliergon (Amblystegiaceae)
  cordifolium (Hedw.) Kindb.: VP, Dutton; CL, Pumphrey 8; GM, Dutton 162.
  giganteum (Schimp.) Kindb.: VV, Dutton 676; CL, Ragan 36.
  richardsonii (Mitt.) Kindb.: VP, Blanchard VI.
  stramineum (Brid.) Kindb.: GM, NAMP 283 (NY); VV, Dutton.
Calliergonella (Amblystegiaceae)
  cuspidata (Hedw.) Loeske: VP, Frost.
Campylium (Amblystegiaceae)
  chrysophyllum (Brid.) J. Lange.: VV, Grout M213; CL, Grout; GM, Dutton 1429; VP, Frost.
  hispidulum (Brid.) Mitt.: CL, True; GM, Rooks 76-432; VP, Frost 1945.
  polygamum (B.S.G.) C. Jens.: GM, McQueen.
  radicale (P. Beauv.) Grout: GM, Pringle 18.VI.1880; CL, Pumphrey 9.
  stellatum (Hedw.) C. Jens.: VP, Faxon,; CL, Dutton 984; TM, Grout 25.VI.1931 (NY); GM, McQueen 15.
Catoscopium (Catoscopiaceae)
  nigritum (Hedw.) Brid.: CL, Mann M60.
Ceratodon (Ditrichaceae)
  purpureus (Hedw.) Brid.: TM, Carpenter 1916; CL, Sullivan 223a; GM, McQueen 51; VP, McQueen 195.
Cirriphyllum (Brachytheciaceae)
  piliferum (Hedw.) Grout: CL, McQueen.
Climacium (Climaciaceae)
  americanum Brid.: VV, Kirk 29.IV.1926; TM, Gilbert; GM, Howard; VP, Frost 1346.
  dendroides (Hedw.) Web. & Mohr: VV, Kirk; GM, M615; CL, Spencer 105.
Conardia (Amblystegiaceae)
  compacta (C. Mull.) Robins.: CL, Hoisington B4485.

Cratoneuron (Amblystegiaceae)
filicinum (Hedw.) Spruce: VP, Faxon; CL, Grout (NY); VV, Dutton 1911; GM, Dutton 695.
Ctenidium (Hypnaceae)
molluscum (Hedw.) Mitt.: GM, Grout; CL, Johnson; VP, Frost 1476.
Cynodonatium (Dicrancaeae)
alpestre (Wahlenb.) Milde: VP, Dutton 1416; TM, Dutton 125; GM, Pringle 286.
Cyrto-hypnum (Thuidiaceae)
minutulum (Hedw.) B.S.G.: CL, Flynn.
pygmaeum (B.S.G.) Buck & Crum: CL, Flynn; VP, Frost.
Cyrtomnium (Mniaceae)
hymenophylloides (Hub.) Nyh.: VP, Faxon; CL, Pringle; GM, Dutton.
Dichelyma (Fontinalaceae)
capillaceum (With.) Myr.: VV, Kirk; GM, NAMP 46 (NY); VP, Frost 1392.
falcatum (Hedw.) Myr.: CL, Seymour 25,288; VP, Seymour 29,677; GM, Seymour 27,369.
pallescens B.S.G.: VV, Kirk.
Dichodontium (Dicranaceae)
pellucidum (Hedw.) Schimp.: VP, Frost 1470.
Dicranella (Dicranaceae)
heteromalla (Hedw.) Schimp.: VP, Blanchard M73; VV, Carpenter; CL, Stone 3; GM, McQueen 203.
rufescens (With.) Schimp.: GM, McQueen 135.
varia (Hedw.) Schimp.: CL, Pringle; VP, Frost 1389; GM, McQueen 16.
Dicranodontium (Dicranaceae)
denudatum (Brid.) Britt.: VP, Lorenz; GM, Johnson 1905; CL, Rooks 76-324.
Dicranoweisia (Dicranaceae)
crispula (Hedw.) Lindb.: CL, Johnson 1903.
Dicranum (Dicranaceae)
bonjeanii De Not.: CL, Flynn.
flagellare Hedw.: VP, Blanchard M97; GM, Carpenter; CL, Dutton 2692; VV, Dobbin 14.IV.
fulvum Hook.: CL, Grout 1909 (NY); GM, Knight 407; VV, Grout 98; VP, Kirk.
fuscescens Turn.: CL, Howard 18.VIII.1972; TM, Carpenter; GM, McQueen 119.
montanum Hedw.: CL, Dutton 697; GM, Rooks 76-9.
muehlenbeckii B.S.G.: CL, Eaton; TM, Kirk 28.
ontariense Peters.: CL, Dutton 664; TM, Carpenter; GM, Rooks 76-254.
polysetum Sw.: VP, Faxon 1881; CL, Pringle 375; GM, McQueen 2.
scoparium Hedw.: VV, Dutton 2058; GM, Losure 54; CL, Stone 29; VP, Dutton 1907.
spurium Hedw.: VV, Kirk; CL, Grout (NY); VP, Frost.
undulatum Brid.: TM, Dobbin; CL, Dutton 569; VP, Frost; VV, Rooks 76-431.
viride (Sull. & Lesq.) Lindb.: GM, Eaton 3042.
Didymodon (Pottiaceae)
fallax (Hedw.) Zand.: CL, Pringle 5.X.1878; VP, Frost.
fallax var. *reflexus* (Brid.) Zand.: CL, Flynn.
rigidulus var. *gracilis* (Schleich.) Zand.: VP, Frost.

tophaceus (Brid.) Lisa: CL, Flynn; VP, Frost.

Diphyscium (Buxbaumiaceae)
foliosum (Hedw.) Mohr: CL, Dutton 197; TM, Dole 89; GM, Schoch 29.

Distichium (Ditrichaceae)
capillaceum (Hedw.) B.S.G.: GM, Pringle; VP, Dutton 1417.
inclinatum (Hedw.) B.S.G.: GM, Dutton.

Ditrichum (Ditrichaceae)
ambiguum Best: GM, Grout (NY).
flexicaule (Schwaegr.) Hampe: CL, Grout.
lineare (Sw.) Lindb.: CL, Dutton 1973; GM, Dutton 666; VP, McQueen 181.
pallidum (Hedw.) Hampe: VP, Dutton 349; GM, Grout 1902 (NY); CL, Grout 1898 (NY); VV, Rooks 76-413.
pusillum (Hedw.) Hampe: CL, Dutton 1637; GM, McQueen 48; VP, McQueen 192.
rhynchostegium Kindb.: GM, Carpenter.

Drepanocladus (Amblystegiaceae)
aduncus (Hedw.) Warnst.: VP, Faxon 1885; CL, Griffin; VV, Dutton 806.
aduncus var. *kneiffii* (B.S.G.) Monk.: VV, Kirk; VP, Faxon 1882 (NY); CL, Dutton 2172.
sendtneri (Hedw.) Warnst.: VP, Faxon 1881; GM, Grout 1901; CL, Dutton 486; VV, Kirk.

Drummondia (Orthotrichaceae)
prorepens (Hedw.) Britt.:CL, Dutton 800; TM, Kirk 1910; VP, Frost 1394; GM, Rooks 76-459.

Encalypta (Encalyptaceae)
ciliata Hedw.: TM, Dutton 1911; VP, Blanchard 108; CL, Rand; GM, Pringle 1880; VV, Dobbin 1907.
procera Bruch: CL, Kirk.

Entodon (Entodonaceae)
brevisetus (Hook. & Wils.) Lindb.: VP, McQueen 114.
cladorrhizans (Hedw.) C. Mull.: VV, Grout M70; GM, Dutton 214; CL, Dutton 1087; VP, McQueen 169.
seductrix (Hedw.) C. Mull.: CL, Dutton 1916; VV, Kirk; VP, Frost 1386.

Eurhynchium (Brachytheciaceae)
hians (Hedw.) Sande Lac.: CL, Flynn 1896.
pulchellum (Hedw.) Jenn.: VP, Faxon 1885; CL, Charette 743.

Fissidens (Fissidentaceae)
adianthoides Hedw.: GM, NAMP 6 (NY); CL, Zomlefer 124; VP, Frost 1399.
bryoides Hedw.: GM, Pringle 1880; VP, Frost 1400; CL, Schoch 69.
bushii (Card. & Ther.) Card. & Ther.: VP, McQueen 170.
dubius P. Beauv.: VP, Blanchard M110; CL, Pringle P127; GM, Carpenter 1935; VV, Rooks 76-447.
fontanus (B. Pyl.) Steud.: VP, Frost 1377; Dutton 2477.
osmundioides Hedw.: VP, Faxon 1884; CL, Dutton 1546; GM, Pringle 1880.
subbasilaris Hedw.: CL, Dutton 2194.
taxifolius Hedw.: CL, Dutton 2009; VP, Dutton 1332.

Fontinalis (Fontinalaceae)
  antipyretica Hedw.: NE, Keir 29; GM, NAMP 281 (NY); CL, Dutton 2061.
  dalecarlica B.S.G.: GM, NAMP 22 (NY); CL, Ragan 67; VP, Frost 1091.
  novae-angliae Sull.: GM, NAMP 286 (NY); CL, Libby 75; VP, Frost 1400.
  sullivantii Lindb.: Howard (1975).
Forsstroemia (Leptodontaceae)
  trichomitria (Hedw.) Lindb.: VP, Frost 1415.
Funaria (Funariaceae)
  hygrometrica Hedw.: VP, Blanchard M118; CL, Hood; VV, Dutton 1909; GM, McQueen 10.
Grimmia (Grimmiaceae)
  affinis Hoppe & Hornsch.: CL, Zomlefer 129.
  alpicola var. *rivularis* (Brid.) Wahl.: VP, Faxon 1882; TM, Dutton 756; CL, McQueen 162; GM, McQueen 152.
  donniana Sm.: Howard (1975).
  laevigata (Brid.) Brid.: GM, Dobbin 1912.
  olneyi Sull.: VP, Frost 1403.
  pilifera P. Beauv.: CL, Dutton 2213; GM, Grout 1903.
  torquata Hornsch.: CL, Dutton 2213.
  unicolor Hook.: CL, Grout 1896; VP, Frost.
Gymnostomum (Pottiaceae)
  aeruginosum Sm.: CL, Dutton 2095; GM, Pringle 1880; VP, Frost 1404; VV, Dobbin; TM, Dole 36.
Hamatocaulis (Amblystegiaceae)
  vernicosus (Mitt.) Hedenas: VP, Grout 1896; GM, McQueen 69; CL, Flynn; VV, Kirk.
Haplohymenium (Anomodontaceae)
  triste (Ces.) Kindb.: VP, Faxon 1884; CL, Flynn; GM, Pringle 167; TM, Dutton 1910.
Hedwigia (Hedwigiaceae)
  ciliata (Hedw.) P. Beauv.: CL, McQueen 145; GM, McQueen 19; VP, McQueen 216.
Helodium (Helodiaceae)
  blandowii (Web. & Mohr.) Warnst.: CL, Dutton 2019; VP, Dobbin 1910.
  paludosum (Sull.) Aust.: VV, Dutton 603; CL, Dutton 1470; VP, Frost 1474.
Herzogiella (Hypnaceae)
  striatella (Brid.) Iwats.: VP, Dutton 426; CL, Rooks 76-18; GM, Ragan 43.
  turfacea (Lindb.) Iwats.: VP, Blanchard M218; Cl, Grout 1896; GM, NAMP 89 (NY).
Heterocladium (Pterigynandraceae)
  dimorphum (Brid.) B.S.G.: GM, NAMP 169 (NY); VP, Frost 1492.
Homalia (Neckeraceae)
  trichomanoides (Hedw.) B.S.G.: CL, Grout 1898; VP, Dutton 2206.
Homalotheciella (Brachytheciaceae)
  subcapillata (Hedw.) Broth.: VP, Frost 1410.
Homomallium (Hypnaceae)
  adnatum (Hedw.) Broth.: CL, Dutton 1206; GM, NAMP 144 (NY); VP, Blanchard M210.

Hygroamblystegium (Amblystegiaceae)
fluviatile (Hedw.) Loeske: VV, Andrews 27.VI.1902; CL, Pringle P146; GM, Pringle P302; VP, NAMP 190 (NY).
tenax (Hedw.) Jenn.: CL, Grout 1909 (NY); GM, Pringle 24.X.1880; VP, Faxon 8.VIII.1881.
Hygrohypnum (Amblystegiaceae)
closteri (Aust.) Grout: GM, Grout.
eugyrium (B.S.G.) Loeske: CL, Rooks 76-540; GM, Spencer 123.
luridum (Hedw.) Jenn.: VP, Frost 1478; GM, Losure 68.
micans (Mitt.) Broth.: GM, Dutton.
molle (Hedw.) Loeske: GM, Kirk 6514.
montanum (Lindb.) Broth.: GM, Grout 1931; VV, Kirk.
ochraceum (Turn.) Loeske: VV, NAMP 111a (NY); GM, Zomlefer 138.
Hylocomiastrum (Hylocomiaceae)
pyrenaicum (Spruce) Fleisch.: VP, Faxon 1884; GM, NAMP 146 (NY).
umbratum (Hedw.) Fleisch.: GM, McQueen 54; VP, Faxon 1884.
Hylocomium (Hylocomiaceae)
splendens (Hedw.) B.S.G.: CL, Grout 1902; VP, Frost 1511; GM, Schoch 42.
Hymenostylium (Pottiaceae)
recurvirostre (Hedw.) Dix.
Hypnum (Hypnaceae)
cupressiforme Hedw.: CL, Pringle 295; VP, Frost 3105.
curvifolium Hedw.: VP, Frost 1513; VV, Kirk 1910; CL, Flynn 1912.
fertile Sendtn.: GM, NAMP 54 (NY).
imponens Hedw.: CL, Hood 1902; VP, Frost 1482; GM, Rooks 76-6.
lindbergii Mitt.: CL, Losure 125; GM, Zomlefer 132; VP, McQueen 223.
pallescens (Hedw.) P. Beauv.: CL, Pringle 123; VV, Kirk 1910; GM, McQueen 44; VP, McQueen 190.
pratense (Rabenh.) W. Koch: CL, Grout 595; GM, Grout M169; VP, Frost 1503.
Isopterygiopsis (Hypnaceae)
muelleriana (Schimp.) Iwats.: GM, NAMP 59 (NY); VV, Kirk.
pulchellum (Hedw.) Iwats.: GM, Grout.
Leptobryum (Bryaceae)
pyriforme (Hedw.) Wils.: CL, Grout 50; VP, Frost 1373; GM, Dobbin 1910; TM, Kirk 1921.
Leptodictyum (Amblystegiaceae)
humile (P. Beauv.) Ochyra: CL, Dutton 1268; VV, Grout 1931; VP, Anon.
riparium (Hedw.) Warnst. CL, Pringle 21.IX.1880; GM, Faxon 17.VIII.1882 (NY); VV, Dutton IV.1910; VP, Frost.
Leskea (Leskeaceae)
obscura Hedw.: CL, Dutton 332; GM, Pringle 1880; VP, Faxon 1881.
polycarpa Hedw.: CL, Dutton 1373; VP, Balch 10; VV, Kirk 1910; GM, McQueen 90.
Leskeella (Leskeaceae)
nervosa (Brid.) Loeske: GM, NAMP 175 (NY).

Leucobryum (Leucobryaceae)
- *albidum* (Brid.) Lindb.: GM, McQueen 36.
- *glaucum* (Hedw.) Angstr.: VV, Carpenter; VP, Blanchard M225; CL, Losure 100; GM, Rooks 76-329.

Leucodon (Leucodontaceae)
- *brachypus* Brid.: CL, Dutton 374; GM, Dutton 1911.
- *brachypus* var. *andrewsianus* Crum & Anderson: VP, Faxon 1884; CL, Dutton 1592; GM, Faxon 1884.
- *julaceus* (Hedw.) Sull.: CL, Flynn.

Limprichtia (Amblystegiaceae)
- *revolvens* (Sw.) Loeske

Lindbergia (Leskeaceae)
- *brachyptera* (Mitt.) Kindb.: GM, Grout 1903.

Loeskeobryum (Hylocomiaceae)
- *brevirostre* (Brid.) B.S.G.: CL, Dutton; GM, NAMP 44 (NY).

Meesia (Meesiaceae)
- *triquetra* (Richt.) Angstr.: CL, Pringle 1878; VV, Kirk.

Mnium (Mniaceae)
- *ambiguum* H. Mull.: VP, Faxon 1885; CL, Pringle 1877.
- *hornum* Hedw.: GM, Grout 1903; CL, Dutton; VP, Frost 1426.
- *marginatum* (With.) Brid.: CL, Dutton 1277; VP, Faxon 1884.
- *spinulosum* (Voit) Schwaegr.: GM, Dutton 202; VP, Dobbin.
- *stellare* Hedw.: CL, Dutton 228; VP, Frost 1425.
- *thomsonii* Schimp.: GM, Pringle 1880; CL, Pringle P119.

Myurella (Pterigynandraceae)
- *julacea* (Schwaegr.) B.S.G.: GM, Grout 620; VP, Faxon 1884.
- *sibirica* (C. Mull.) Reim.: VV, NAMP 205 (NY); GM, Dutton 156; VP, Dutton 1910; CL, Spencer 111.

Neckera (Neckeraceae)
- *complanata* (Hedw.) Hub.: CL, Dutton 833; VP, Hoisington BT-501.
- *pennata* Hedw.: GM, Knight M534; VP, Frost 1427; CL, Dutton 2195.

Oncophorous (Dicranaceae)
- *wahlenbergii* Brid.: GM, Knight 1882; VP, Carpenter 1932; CL, Dutton 2468.

Orthotrichum (Orthotrichaceae)
- *anomalum* Hedw.: GL, Pringle P68; GM, McQueen 139; VP, McQueen 197.
- *obtusifolium* Brid.: CL, Dutton 1585.
- *ohioense* Sull. & Lesq.: CL, Dutton 1205.
- *pumilum* Sw.: CL, Dutton.
- *sordidum* Sull. & Lesq.: GM, Grout 1906.
- *speciosum* Nees: GM, Grout 29.VIII.1906; VP, Carpenter 1931.
- *stellatum* Brid.: GM, Stone 18; CL, Dutton 1585.
- *strangulatum* P. Beauv.: CL, Dutton 735; GM, Grout; VP, Frost 1432.

Oxystegus (Pottiaceae)
 tenuirostris (Hook. & Tayl.) A.J.E. Sm.: GM, Grout.
Paludella (Meesiaceae)
 squarrosa (Hedw.) Brid.: VP, Winslow 1130.
Palustriella (Amblystegiaceae)
 commutata (Brid.) Ochyra: VP, Faxon.
Paraleucobryum (Dicranaceae)
 longifolium (Hedw.) Loeske: VP, Dutton 429; GM, Rooks 76-102.
Philonotis (Bartramiaceae)
 fontana (Hedw.) Brid.: CL, Pringle 1880; VP, Blanchard M245; GM, Dobbin 7602.
 marchica (Hedw.) Brid.: CL, Dutton; GM, Dutton; VP, Dutton.
Physcomitrium (Funariaceae)
 pyriforme (Hedw.) Hampe: VV, Dutton 1910; CL, Codding 1898; VP, McQueen 222.
Plagiobryum (Bryaceae)
 zierii (Hedw.) Lindb.: GM, Kennedy (VT, NY).
Plagiomnium (Mniaceae)
 affine (Bland) T. Kop.: GM, Flynn 8311.
 ciliare (C. Mull.) T. Kop.: VP, Blanchard 1885; CL, Dutton 101; VV, Flynn 8309; GM, Rooks 75-23.
 cuspidatum (Hedw.) T. Kop.: VP, Blanchard M234; GM, Rooks 76-263; VV, Flynn 8527; CL, Libby 35.
 drummondii (Bruch & Schimp.) T. Kop.: VP, Faxon 1885; CL, Zomlefer 127; GM, Rooks 76-164.
 medium (B.S.G.) T. Kop.: CL, Dutton 1632.
 rostratum (Schrad.) T. Kop.: CL, Dutton 1275; GM, Carpenter 1916; VP, Frost 1363.
Plagiopus (Bartramiaceae)
 oederiana (Sw.) Crum & Anderson: CL, Bates & Gilbert 1903; VV, Grout 1892; GM, Pringle P310.
Plagiothecium (Plagiotheciaceae)
 cavifolium (Brid.) Iwats.: VV, Kirk 1921; CL, Pringle 126; VP, Pringle P19; GM, McQueen 42.
 denticulatum (Hedw.) B.S.G.: VP, Dutton 426a; CL, Hood 1902; GM, McQueen 62; VV, Grout.
 laetum B.S.G.: CL, Pringle P120; GM, Rooks 76-81.
Platydictya (Hypnaceae)
 confervoides (Brid.) Crum: CL, Dutton 1287; VV, Dutton; VP, Faxon.
 jungermannioides (Brid.) Crum: CL, Dutton 832.
 subtilis (Hedw.) Crum: GM, Grout 1901.
Platygyrium (Hypnaceae)
 repens (Brid.) B.S.G.: GM, Grout 1900; VV, Dutton 1910; CL, Rooks 75-35.
Platyhypnidium (Brachytheciaceae)
 riparioides (Hedw.) Dix.: GM, Dutton 1400; VP, Dutton 26.

Platylomella (Amblystegiaceae)
  lescurii (Sull.) Andrews: GM, Grout.
Pleuridium (Ditrichaceae)
  subulatum (Hedw.) Rabenh.: CL, Dutton 1634.
Pleurozium (Hylocomiaceae)
  schreberi (Brid.) Mitt.: VP, Faxon 1881; CL, Losure 128; GM, McQueen 8.
Pogonatum (Polytrichaceae)
  dentatum (Brid.) Brid.: VV, Rooks 76-423; GM, Alexander 15.
  pensilvaticum (Hedw.) P. Beauv.: CL, Dutton 1959; VP, Frost 1438; GM, McQueen 164.
  urnigerum (Hedw.) P. Beauv.: VP, Blanchard M252; GM, Libby 86.
Pohlia (Bryaceae)
  cruda (Hedw.) Lindb.: CL, Dutton 1279; GM, Carpenter; VP, Frost 1366.
  drummondii (C. Mull.) Andrews: GM, Grout 1436.
  elongata Hedw.: GM, Dutton 1343.
  nutans (Hedw.) Lindb.: VP, Faxon 1884; CL, Dutton 1018; GM, Dobbin 7603.
  proligera (Kindb.) Lindb.: GM, Grout 1906.
  wahlenbergii (Web. & Mohr) Andrews: CL, Grout M613; GM, McQueen 224; VP, Frost.
Polytrichastrum (Polytrichaceae)
  alpinum (Hedw.) G.L. Sm.: VP, Faxon 1881; GM, McQueen 28.
Polytrichum (Polytrichaceae)
  commune Hedw.: TM, Carpenter 1930; VP, Frost 1435; CL, Spencer 119; GM, McQueen 22.
  formosum Hedw.: GM, Hoisington BR-179; VP, Frost 1433.
  juniperinum Hedw.: TM, Carpenter; CL, Losure 120; VV, Dutton 1909; GM, McQueen 14.
  ohioense Ren. & Card.: VV, Kirk 6523; GM, Rooks 76-28; CL, Dutton 1262.
  pallidisetum Funck: GM, Pringle.
  piliferum Hedw.: CL, Hood 1902; TM, Dutton 5244; GM, McQueen 14; VP, McQueen 182.
  strictum Brid.: GM, Dutton 1706; CL, Spencer 117.
Pottia (Pottiaceae)
  truncata (Hedw.) Furnr.: CL, Pumphrey 43; VP, Frost 1437.
Pseudobryum (Mniaceae)
  cinclidioides (Hub.) T. Kop.: GM, Grout 1906.
Pseudotaxiphyllum (Hypnaceae)
  distichaceum (Mitt.) Iwats.: GM, Rooks 76-416.
  elegans (Brid.) Iwats.: GM, Grout 1906; VP, Seymour 29,647.
Pterigynandrum (Pterigynandraceae)
  filiforme Hedw.: GM, NAMP 142.
Ptilium (Hypnaceae)
  crista-castrensis (Hedw.) De Not.: TM, Flynn 8300; VP, Alexander 51; GM, McQueen 7.
Pylaisiella (Hypnaceae)
  intricata (Hedw.) Grout: CL, Pringle 192; VV, Jones 892; VP, Frost; GM, Dutton 488.
  polyantha (Hedw.) Grout: VP, Morgan 903; GM, Rooks 76-50.
  selwynii (Kindb.) Crum, Steere, & Anderson: CL, Hood; GM, McQueen 126.

- *Racomitrium* (Grimmiaceae)
  - *aciculare* (Hedw.) Brid.: VV, Kirk 1910; GM, Alexander 30.
  - *canescens* (Hedw.) Brid.: GM, Pringle 382; VV, Kirk 1910.
  - *fasciculare* (Hedw.) Brid.: GM, Dutton 391.
  - *heterostichum* (Hedw.) Brid.: GM, Rooks 76-334.
  - *mirocarpon* (Hedw.) Brid.: GM, McQueen 123.
- *Rauiella* (Thuidiaceae)
  - *scitum* (P. Beauv.) Aust.: CL, Dutton 1604; GM, Grout 190; VP, Frost 1485.
- *Rhabdoweisia* (Dicranaceae)
  - *crispata* (With.) Lindb.: GM, Thompson 1935.
- *Rhizomnium* (Mniaceae)
  - *appalachianum* T. Kop.: GM, Grout.
  - *magnifolium* (Horik.) T. Kop.: VP, Blanchard M235; GM, Knight 509; CL, Rooks 76-533.
  - *pseudopunctatum* (Bruch & Schimp.) T. Kop.: VP, Sullivan 254; GM, McQueen.
  - *punctatum* (Hedw.) T. Kop.: GM, Flynn 8310; CL, Dutton 1548; VP, Frost 1424.
- *Rhodobryum* (Bryaceae)
  - *roseum* (Hedw.) Limpr.: GM, Kirk 3605; CL, Alexander 17; VP, Frost.
- *Rhytidiadelphus* (Hylocomiaceae)
  - *loreus* (Hedw.) Warnst.: GM, McQueen 20.
  - *squarrosus* (Hedw.) Warnst.: GM, NAMP 284 (NY).
  - *triquetrus* (Hedw.) Warnst.: TM, Carpenter 1935; CL, Dutton 2693; VP, McQueen 146.
- *Rhytidium* (Rhytidiaceae)
  - *rugosum* (Hedw.) Kindb.: CL, NAMP 26 (NY).
- *Saelania* (Ditrichaceae)
  - *glaucescens* (Hedw.) Broth.: VP, Blanchard M222.
- *Sanionia* (Amblystegiaceae)
  - *uncinata* (Hedw.) Loeske: GM, NAMP 101 (NY); VP, Frost 1508; CL, Alexander 1.
- *Schistidium* (Grimmiaceae)
  - *agassizii* Sull. & Lesq.: GM, McQueen 140; VP, McQueen 219; CL, McQueen 143.
  - *apocarpum* (Hedw.) Bruch & Schimp.: VP, Dutton 797; CL, Dutton 1937; VV, Kirk 1910; GM, Dutton 489.
- *Schistostegia* (Schistostegaceae)
  - *pennata* (Hedw.) Web. & Mohr: GM, Hoisington Br-447.
- *Scorpidium* (Amblystegiaceae)
  - *scorpioides* (Hedw.) Limpr.: VP, Pringle M186.
- *Seligeria* (Seligeriaceae)
  - *calcarea* (Hedw.) B.S.G.: VP, Faxon.
  - *pusilla* (Hedw.) B.S.G.: GM, Grout 1900.
  - *tristichoides* Kindb.: VP, Kennedy 13.VI.1896.
- *Sematophyllum* (Sematophyllaceae)
  - *adnatum* (Michx.) Britt.: GM, Rooks 76-95.
  - *marylandicum* (C. Mull.) Britt.: VV, NAMP 201 (NY).

Sphagnum (Sphagnaceae)
austinii Sull.: GM, Flynn 4.VII.1913; VP, Flynn.
angustifolium (Russ.) C. Jens.: GM, Kappel 2; CL, Stone 1c; VP, McQueen.
capillifolium (Ehrh.) Hedw.: GM, McQueen 130; CL, Flynn 1912; VP, Blanchard M284.
capillifolium var. *tenellum* (Schimp.) Crum: CL, McQueen 486; GM, McQueen 331; VP, McQueen 823.
centrale C. Jens.: CL, Stone 51a; GM, Dutton 1422; VP, McQueen 651.
contortum Schultz: CL, Dutton 1475.
cuspidatum Ehrh.: GM, Sullivan 692; CL, McQueen 444; VP, McQueen 900.
fallax (Klinggr.) Klinggr.: GM, Kappel 17; CL, McQueen 711; VP, McQueen 789.
fimbriatum Wils.: GM, Carpenter 1939; CL, Stone 1b; VP, McQueen 788.
flexuosum Dozy & Molk.: VV, Dutton 282; GM, McQueen 350.
fuscum (Schimp.) Klinggr.: CL, Balch 1076; GM, Kappel 5; VP, McQueen 801.
girgensohnii Russ.: CL, Kirk 951; GM, Rooks 75-9; VP, McQueen 888.
henryense Warnst.: Stone 6a.
lescurii Sull.: VV, Dutton 180; GM, McQueen 2.IX.1983.
magellancium Brid.: VV, Dutton 183; GM, Kappel 6; CL, Dutton 1994; VP, McQueen 880.
palustre L.: CL, Pringle; GM, Dutton 56.
papillosum Lindb.: CL, Dutton 441; CL, Kirk 955; VP, Kappel 15.
pulchrum (Braithw.) Warnst.: GM, McQueen 2.IX.1983.
quinquefarium (Briathw.) Warnst.: VP, McQueen 1467; GM, McQueen 1001.
recurvum P. Beauv.: VV, Dutton 182; CL, Dutton 178; VP, Sullivan 680; GM, McQueen 1211.
riparium Angstr.: GM, Wilmont 6.VI.1983.
russowii Warnst.: CL, Kirk 953; VP, Kappel 20; GM, Rooks 76-35; VV, Dutton 223.
squarrosum Crome: TM, Carpenter 1939; VP, Carpenter 1941; CL, Dutton 952; GM, McQueen 25.
subfulvum Russ. & Warnst.: CL, Stone 9; GM, Dutton 1397.
subsecundum Nees: GM, McQueen 4; CL, Pringle 1880.
subtile (Russ.) Warnst.: GM, Smith 1936; CL, Dutton 251; VP, McQueen 1237.
teres (Schimp.) Angstr.: VV, Dutton 181; CL, Stone 10a; GM, McQueen 1111; VP, McQueen 1268.
warnstorfii Russ.: CL, Stone 11; VV, Dutton 181a; GM, Dobbin 26.IX.1909; VP, McQueen 1280.
wulfianum Girg.: CL, Dutton 134; GM, McQueen 777; VP, McQueen 1301.
Splachnum (Splachnaceae)
ampullaceum Hedw.: GM, Dobbin 10.VI.1910.
pennsylvanicum (Brid.) Grout: GM, Grout.
Steerecleus (Brachytheciaceae)
serrulatum (Hedw.) Robins.: CL, Dutton 1557; VP, Frost.
Taxiphyllum (Hypnaceae)
alternans (Card.) Iwats.: CL, Grout 609; GM, NAMP 174 (NY).
deplanatum (Bruch & Schimp.) Fleisch.: GM, Losure 71.

Tayloria (Splachnaceae)
  serrata (Hedw.) B.S.G.: GM, Kennedy 3.VII.1897 (NY).
Tetraphis (Tetraphidaceae)
  pellucida Hedw.: GM, McQueen 128; CL, Dutton 1488; VP, Blanchard 267.
Tetraplodon (Splachnaceae)
  mnioides (Hedw.) B.S.G.: GM, Grout 1893; CL, Kirk 1915.
Thamnobryum (Thamnobryaceae)
  alleghaniense (C. Mull.) Nieuwl.: VP, Forst 1520; GM, Grout 1900; CL, Grout 1898; VV, Grout 1904.
Thelia (Theliaceae)
  asprella Sull.: GM, Grout 1900.
  hirtella (Hedw.) Sull.: VV, Carpenter; VP, Frost 1462.
Thuidium (Thuidiaceae)
  delicatulum (Hedw.) B.S.G.: VV, Grout 1902; VP, Blanchard; CL, Spencer 104; Rooks 76-310.
  recognitum (Hedw.) Lindb.: CL, NAMP 77 (NY); VP, Frost 1509; GM, McQueen 49.
Timmia (Timmiaceae)
  megapolitana Hedw.: VP, Pringle 1876; CL, Dutton 360; GM, Kirk 1910.
Tomenthypnum (Brachytheciaceae)
  nitens (Hedw.) Loeske: VV, Andrews 1902; VP, Lorenz 1903; CL, Dutton 253.
Tortella (Pottiaceae)
  fragilis (Drumm.) Limpr.: VP, Faxon 1885.
  humilus (Hedw.) Jenn.: CL, Pringle 1877; VV, Dutton 1910; VP, Frost 1357.
  inclinata (Hedw.) Limpr.: Crum & Anderson (1981).
  tortuosa (Hedw.) Limpr.: GM, Carpenter 1935; CL, Grout 618; VP, Rugg.
Tortula (Pottiaceae)
  mucronifolia Schwaegr.: VV, Dutton 184; CL, Dutton; VV, Dutton.
  ruralis (Hedw.) Gaertn., Meyer, & Scherb.: CL, McQueen 163; TM, Dutton 1911.
Trematodon (Bruchiaceae)
  ambiguus (Hedw.) Hornsch.: CL, Dutton 1844; VV, Kirk 1910; VP, McQueen 172.
  longicolis Michx.: VP, Frost 1467.
Ulota (Orthotrichaceae)
  coarctata (P. Beauv.) Hammar: CL, Dutton 1560; VP, Frost 1431; GM, McQueen 209.
  crispa (Hedw.) Brid.: VP, Blanchard 269; CL, Dutton 1928; GM, McQueen 210.
  hutchinsiae (Sm.) Hammar: VV, Grout M270; GM, NAMP 8 (NY); VP, Frost 1430; TM, Carpenter 1934.
Warnstorfia (Amblystegiaceae)
  exannulata (Schimp.) Loeske: GM, NAMP 276 (NY); VV, Dutton 1909.
  fluitans (Hedw.) Loeske: GM, NAMP 277 (NY); VP, Faxon 1882 (NY); CL, Dutton 692.
  fluitans var. *falcata* (Sanio) Crum & Anderson: GM, McQueen 667.
Weissia (Pottiaceae)
  controversa Hedw.: CL, Alexander 12; VP, Frost 1469.

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Literature Cited

Anderson, L. E., H. A. Crum, & W. R. Buck. 1990. List of the mosses of North America North of Mexico. *The Bryologist* 93: 448-501.

Anderson, L. E. 1990. A checklist of *Sphagnum* in North America north of Mexico. *The Bryologist* 93: 500-501.

Andrews, A. L. 1906. Preliminary lists of New England Plants,- XVIII. Sphagnaceae. *Rhodora* 62-65.

Andrus, R. E. 1980. Sphagnaceae (peat moss family) of New York State. *New York State Museum Bulletin* 442. Albany, New York.

Crum, H. 1984. Sphagnopsida. Sphagnaceae. *North American Flora* Series II, 11. New York Botanical Garden. Bronx, New York.

Crum, H. & L. E. Anderson. 1981. *Mosses of eastern North America.* Columbia Univeristy Press. New York.

Frost, C. C. 1873. Mosses of Vermont. *Archives of Science and Transactions of the Orleans County Society of Natural Sciences.* 1: 111, 152, 192.

Grout, A. J. 1898. *A list of the mosses of Vermont with analytical keys to the genera and species.* Contributions to the Botany of Vermont, 1. University of Vermont. Burlington, Vermont.

__________. 1928-1936. *Moss flora of North America. north of Mexico.* 3 vols. Privately published. Newfane, Vermont.

Grout, A. J. & E. J. Dole. 1932. The mosses of Vermont. *The Joint Bulletin of the Vermont Botanical and Bird Club* 15: 23-53.

Howard, L. D. 1975. Moss flora of New England, New York, and southeastern Canada. *Agriculture Experiment Station Bulletin* 680. Univerity of Vermont. Burlington, Vermont.

Ireland, R. R. 1982. Moss flora of the Maritime Provinces. *Publications in Botany*, No. 13. Nation Museum of Natural Resources. Ottawa, Canada.

Jacobs, E. C. 1963. *The physical features of Vermont.* Vermont Geological Survey, Department of Water Resources. Montpelier, Vermont.

Johnson, C.W. 1984. *The nature of Vermont.* The University Press of New England. Hanover, New Hampshire.

McQueen, C. B. 1985. Sphagnaceae of Vermont. *Evansia* 2: 13-15.

__________. 1986. Checklist of Vermont Liverworts. *Evansia* 3: 26-28.

Schuster, R. M. 1953. Boreal Hepaticae. A manual of the liverworts of Minnesota and Adjacent Regions. *The American Midland Naturalist* 49: 257-684.

Schuster, R. M. 1966-1980. *The Hepaticae and Anthocerotae of North America.* Vols. 1-4. Columbia University Press, New York.

Steere, W. C. 1948. Abel Joel Grout (1867-1947). *The Bryologist* 51: 201-212.

Stotler, R. & B. Crandall-Stotler. 1977. A checklist of the liverworts and hornworts of North America. *The Bryologist* 80: 405-428.

Meritorius Midwest Mosses

William R. Buck[1] & Bruce Allen[2]

Since 1988 the two of us, along with lichenologist Richard Harris, have jointly taken field trips within the United States. Initially we planned to write up the results in an independent publication in the style of the old expedition reports. Lack of time and energy have prevented us from indulging in such extravagances. Nevertheless, during our travels, which have ranged from Florida to Minnesota and from Oklahoma to Delaware, we have encountered a number of mosses that are either rare or unknown from the states in which they were collected. We therefore are using this opportunity to document the most interesting of our midwestern mosses so that the data will be available to those interested in the floristics of the areas under discussion. The floristic status of most of the species in this list, were determined using Redfearn (1987). The majority of our moss records collected during the 1991 Midwest Bryological Foray will be reported by Diana Horton in a forthcoming publication.

Barbula ehrenbergii (Lor.) Fleisch. **Arkansas.** Stone County: Ozark National Forest, Gunner Pool Recreation Area; hardwood forest and bluffs along Little Sylamore Creek, ca 1000 ft., 25 April 1988, *Allen 6285* (MO). New to Arkansas and the Boston Mountain region, previously known from seven Missouri counties on the Salem Plateau.

Bruchia flexuosa (Sw. *ex* Schwaegr.) C. Müll. **Arkansas.** Baxter County: Big Flat, Uncle Willie Huffines Park on State Rd. 14 at E end of town; on soil, 25 April 1988, *Allen 6283 (MO)*; *Buck 15868* (NY). This species deserves mention as an Arkansas county record, as well as for its interesting locality name.

Didymodon rigidulus Hedw. **Arkansas.** Searcy County: 4.1 mi W of jct with St. Rd. 263 on St. Rd. 14, at Baxter County Line; juniper-hardwood forest on steep dolomitic slope above stream, 25 April 1988, *Allen 6275, 6277* (MO). A second report of the species from the Interior Highlands and the first report for it from the Boston Mountain region.

Fissidens neonii (Bartr.) Grout **Oklahoma**. Cherokee County: ca 6 mi N of State Rd. 82 on State Rd. 100, where hwy crosses Terapin Creek. T.14N., R.22W., sect. 24; on moist soil along river, 23 April 1988, *Buck 15773* (NY). This species has not previously been reported from the Interior Highlands. Within the United States it is known from Louisiana, North Carolina and Alabama (Bowers & Timme, 1990).

Fissidens ravenelii Sull. **Arkansas.** Izard County: Calico Rock, ca 2 mi W of town on Calico Road; sandstone outcropping above White River, 26 April 1988, *Buck 15895* (NY). This is the second report of the species from the Salem Plateau of the Interior Highlands, and the first from that area in Arkansas.

Forsstroemia producta (Hornsch.) Par. **Arkansas.** Searcy County: 4.1 mi W of jct. with State Rd. 263 on State Rd. 14, at Baxter county line; on trunk of juniper in juniper-hardwood forest on steep dolomitic slope above stream, 25 April 1988, *Allen 6269* (MO); *Buck 15853* (NY). This is the second locality for the species in Arkansas.

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Physcomitrella patens (Hedw.) Bruch & Schimp. *in* B.S.G. **Missouri**. St. Charles County: near Golden Eagle Ferry landing, off Co. Rd. B, ca 6.5 mi W of State Rd. 94; on muddy shore of the Mississippi River, 3 October 1991, *Allen 10975* (MO); *Buck 21025* (NY). **Illinois**. Jersey County: Pere Marquette State Park; growing on moist soil along the Illinois River, 3 October 1991, *Buck 21022* (NY). This species was previously restricted in Illinois to the northern part of the state. In Missouri the species has been collected along the Mississippi and Missouri rivers. The Missouri collections reported here represent a new county record (Tan, 1978).

Ptychomitrium leibergii Best **Arkansas**. Marion County: vicinity of Crooked Creek, 1.9 mi W of Yellville city limit on US 62; juniper-oak forest over dolomite, 25 April 1988, *Allen 6257, 6262, 6263* (MO); *Buck 15842* (NY). Previously known in the Interior Highlands only from Ozark County, Missouri, this species is new to Arkansas.

Pottia bryoides (Dicks.) Mitt. **Minnesota**. Cottonwood County: ca 2 mi W of US 71, ca 14.5 mi N of Windom, ca 44° 05'40"N, 95°04'30"W, ca 400 m, Sioux quartzite outcrop on N side of road; seasonally dry, flat rock outcrop, 28 September 1991, *Allen 10870* (MO); *Buck 20866* (NY). In North America this species has been reported only from Arizona, California and Saskatchewan (Wareham, 1939).

Tortula chisosa Magill, Delgadillo & Stark **Oklahoma**. Cherokee County: ca 6 mi N of State Rd. 82 on State Rd. 100, where hwy crosses Terapin Creek, T.14N., R.22W., sect. 24; on sandstone bluff along river, 23 April 1988, *Allen 6209* (MO); *Buck 15747* (NY). Only described five years before these collections were made (Magill et al., 1983), the species has been reported in the United States from Texas and New Mexico. The thick-walled cross-walls of the basal leaf cells are much like those of *Encalypta* which may cause difficulties in identification. Redfearn's (1987) single report of *Tortula fragilis* (from the same locality) actually represents this species. *Tortula fragilis* is therefore excluded from the flora of the Interior Highlands of North America.

Literature Cited

Bowers, F. D. & S. L. Timme. 1990. *Fissidens neonii* new to Alabama, and additional reports for *F. asplenioides*, *F. fontanus* and *F. grandifrons* for Alabama. *Bryologist* 93: 30-31.

Magill, R. E., C. Delgadillo & L. R. Stark. 1983. *Tortula chisosa* sp. nov., a bistratose-leaved species from the United States, Mexico, and southern Africa. *Ann. Missouri Bot. Gard.* 70: 200-202.

Redfearn, P. L., Jr. 1987. *Checklist of the mosses of the Interior Highlands of North America in Arkansas, Illinois, Missouri and Oklahoma*. Contributions from the Ozark Regional Herbarium, Southwest Missouri State University, Springfield. MO.

Tan, B. C. 1978 [1979]. *Physcomitriella patens* (Musci: Funariaceae) in North America. Bryologist 81: 561-567.

Wareham, R. T. 1939. *Pottia*. *In*: A. J. Grout, *Moss flora of North America north of Mexico* 1(4): 197-208, pls. 93-97.

The Distribution of North American Bryophytes *Orthotrichum striatum* Hedw.

Dale H. Vitt[1]

The Orthotrichaceous peristome is characterized by having 1) the outer peristomial layer thicker than the primary peristomial layer, 2) the lack of ability to produce cilia, and 3) endostome segments positioned either alternate or opposite to the exostome teeth. Within the genus *Orthotrichum*, the segments are always alternate to the teeth. In general, mesophytic species have well developed endostome segments associated with functional, recurved exostome teeth, while xerophytic species have poorly developed or absent segments associated with non-functional, erect teeth. The mesophytic species often have endostome segments that are two cells wide and are among the most robust found in the genus. Among North American species of the genus, *O. speciosum*, *O. pycnophyllum*, *O. keeverae*, *O. striatum*, and *O. lyellii* are members of the subgenus Phaneroporum, section Leiocarpa and generally occur in relatively mesophytic habitats (Vitt 1973).

Orthotrichum striatum is distinguished by having smooth, immersed capsules with well developed peristomes. The peristome has 16 recurved teeth and 16 well-developed, wide, erect-inflexed segments that appear erose owing to the irregular cell pattern. In comparison, *O. speciosum* (including the variety elegans) has 8 exostome teeth and 8 endostome segments; *O. lyellii*, *O. pycnophyllum*, and *O. keeverae* have lightly ribbed capsules, and the Mexican *O. hortoniae* has long exserted capsules. *Orthotrichum affine* has deeply ribbed capsules. Gametophytically, *O. striatum* is a relatively large species with recurved leaf margins and an autoicous sexual condition and probably cannot be differentiated from the largely sympatric *O. speciosum*.

In the northern part of its North American range, *O. striatum* occurs on the branches and trunks of trees in coniferous forests dominated by *Thuja plicata, Pseudotsuga menziesii, Picea sitchensis, Tsuga menziesii,* and *Chamaecyparis nootkatensis*. However in these forests, it usually occurs on the angiosperm subdominants, particularly species of *Alnus* and *Acer*. It often is found in association with *Metaneckera menziesii, Porella navicularis, Dendroalsia menziesii, Orthotrichum lyellii*, and *O. speciosum*. Also, *O. consimile* and *O. pulchellum* occur in similar habitats as *O. striatum*. In northern California, Dan Norris (in letter) has found this species to be not uncommon on the twigs of deciduous oaks at the edge of natural grassy meadows. These meadows are found between 500 and 1000 metres, inland from the coastal redwoods. Along the west coast of North America and when compared to associated species of *Orthotrichum*, *O. striatum* is always the least common in an area and seemingly sometimes occurs on twigs and small branches well above ground level.

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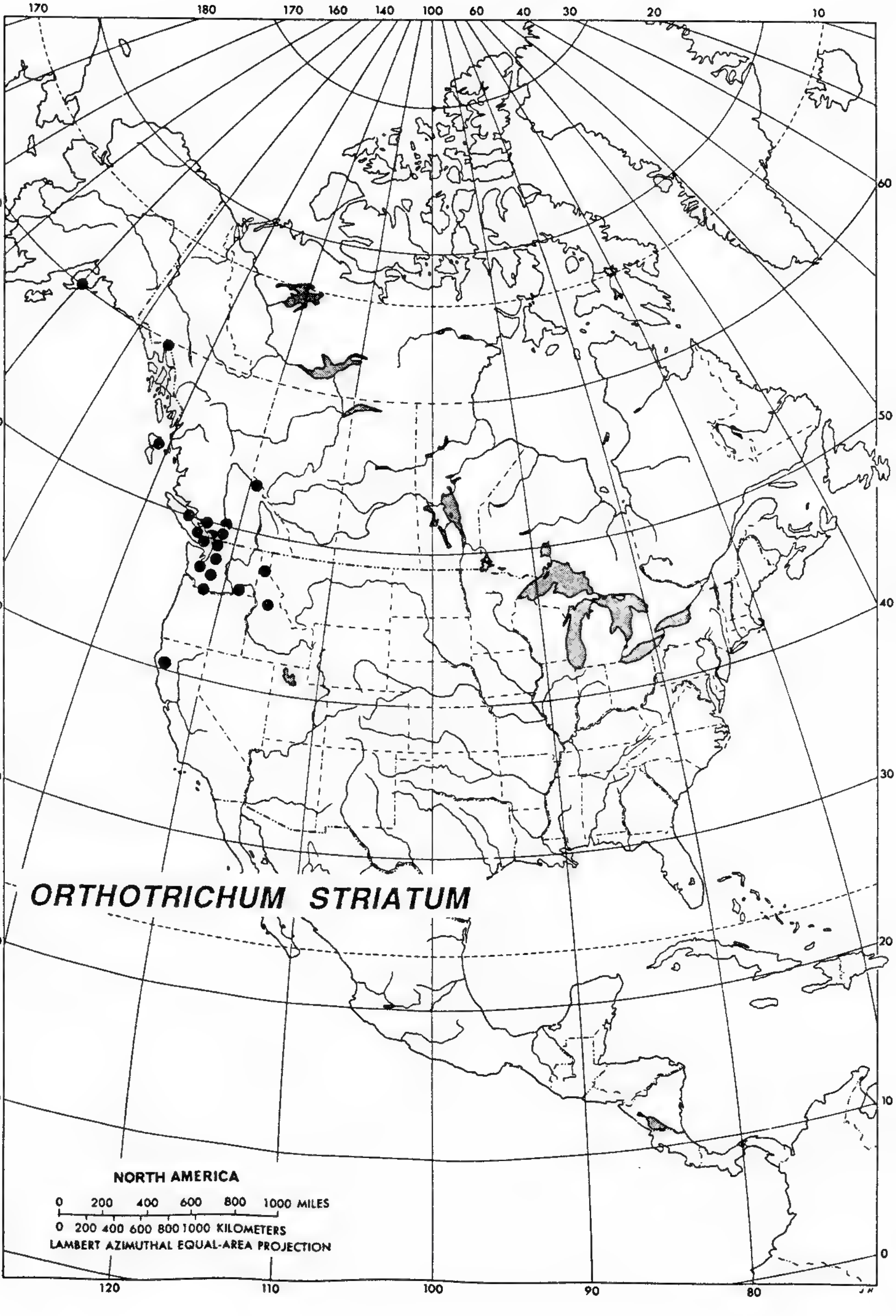
ORTHOTRICHUM STRIATUM
NORTH AMERICA
0 200 400 600 800 1000 MILES
0 200 400 600 800 1000 KILOMETERS
LAMBERT AZIMUTHAL EQUAL-AREA PROJECTION
170
180
170
160
140
100
60
40
30
20
10
60
50
40
30
20
10
0
120
110
100
90
80

In North America, *O. striatum* is restricted to the west coast of the continent. It is a rare species that is known from the Kenai Peninsula of Alaska (Portage Glacier area, *Vitt 18526a* ALTA) south through coastal British Columbia, and Washington to the Columbia River. It is probably more common in northeastern British Columbia than indicated on the map. This paper reports the species from northern California (Humboldt Co., *Norris 68261* ALTA). Inland, the species has been collected in eastern Washington, northern Idaho, and recently along the western slope of the Rocky Mountains of eastern British Columbia (Mt. Robson Provincial Park, *Vitt 25840* ALTA). Although reported from eastern North America, the .pa specimens are either mis-identified or seemingly mislabeled as discussed in Vitt (1973) and Crum & Anderson (1981). *Orthotrichum striatum* is circumboreal in distribution, presently known in Europe from Scandinavia and Great Britain south and east to Switzerland, Austria, Italy, Hungary, Poland and France; and also reported from The Caucasus(!), Kashmir, Algeria. I have not been able to confirm herbarium material named *O. striatum* from northeastern China.

Additional reports, new collections and range extensions should be sent to the author. These findings can be reported in the future editions of this series.

Literature Cited

Crum, H. A. & L. E. Anderson. 1981. *Mosses of Eastern North America*. Volume 2. pp. 665-1328. Columbia University Press, New York.

Vitt, D. H. 1973. A Revision of the genus *Orthotrichum* in North America, North of Mexico. *Bryophytorum Bibliotheca*. Band 1. 208 pp. Cramer, Lehre.

A Study of the Bryophytes of Thermal Meadow, Hotsprings Island, Queen Charlotte Islands, Canada

Won S. Hong, Beth Deffinbaugh, Romona Miller and Barney Sparrow[1]

Thermal Meadow is located near the center of Hotsprings Island, Queen Charlotte Islands. The meadow is oblong and approximately 0.2 hectare in size. A small man-made pool, approximately two meters in diameter, is located in a shallow depression at the northern corner of the meadow.

The floor of the meadow is covered almost exclusively with bryophytes, especially abundant are *Dicranum scoparium, D. undulatum*, and *Hylocomium splendens*. Some exposed drier areas of the meadow are dominated by *Rhacomitrium lanuginosum* while relatively moist areas are dominated by *Sphagnum girgensohnii* and *S. subnitens*. Some Hepaticae, including *Barbilophozia hatcheri* and *Cephaloziella divaricata* are also found with mosses on the floor of the meadow. Along the edge of the meadow, especially on tree bark, the following Hepaticae are abundant: *Frullania franciscana, F. nisquallensis, Radula bolanderi* and *Porella navicularis*.

Along with bryophytes, grasses are abundant on the floor of meadow, especially *Deschampsia caespitosa* and *Holcus lanatus*, both common species along the Pacific coast (Calder & Taylor, 1968). The most common and dominant vascular plant species of area surrounding the meadow are *Thuja plicata* (western red cedar), *Chamaecyparis nootkatensis* (yellow cedar), and *Gaultheria shallon* (salal). The area between original hot spring sites and the meadow exposure is covered by extensive scrub of *Gaultheia shallon*.

The soils of the meadow are shallow and can easily damaged by frequent foot traffic. The rocky foundation of the meadow can be reached without the aid of tools. The ground temperature of the meadow is approximately six to seven degree Celsius higher than the sorrounding area due to geothermal activity near the surface.

The authors made two collecting trips to the meadow during summers of 1990 and 1991 and approximately 250 collections were made. Specimens borrowed from Natural Museum of Chicago (F) and Stockholm, Sweden (S) have also been ircorporated. The collection numbers are those of senior author. Voucher specimens have been depositer at the herbarium of College of Great Falls, Montana (GFC), with available duplicates in the herbarium of South Moresby National Park, Queen Charlotte City, B.C., Canada.

The nomenclature of the Musci follow Vitt (1982) and Ireland et al. (1987); and that of Hepaticae follow Stotler & Crandall-Stotler (1977) and Grolle (1983a, 1983b). Only one representative specimen of each taxon is cited.

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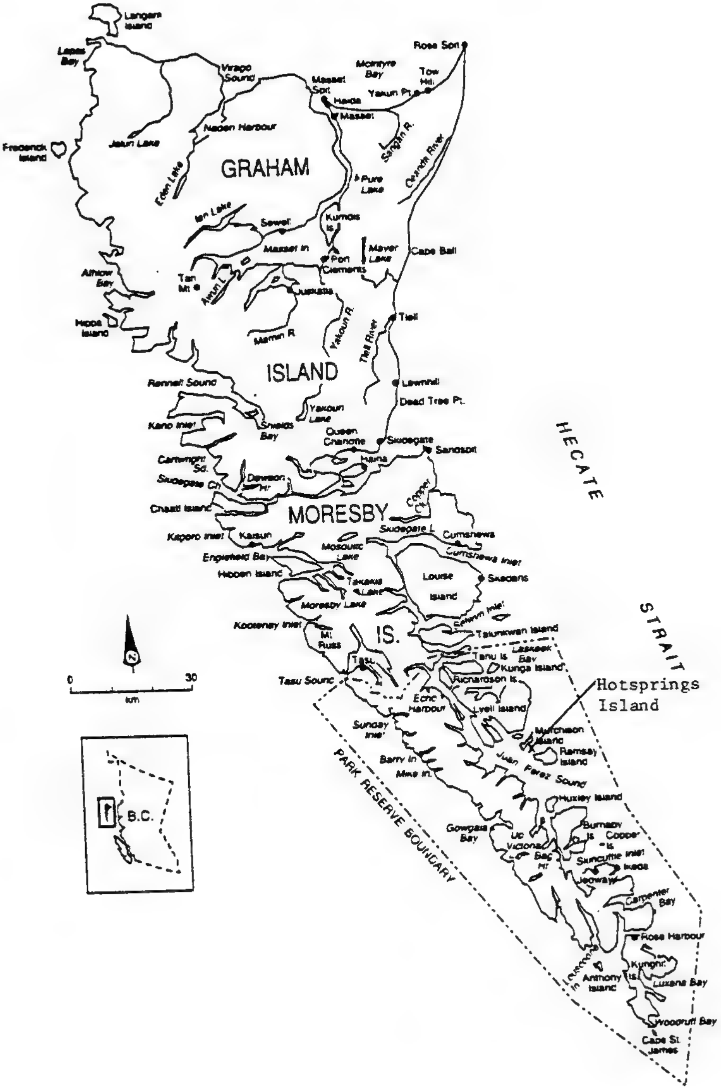

Hotsprings Island in Queen Charlotte Islands (After Provisional Resource Description & Analysis, South Moresby/Gwaii Haanas National Park Reserve 1990)

Annotated Checklist of Musci and Hepaticae

Musci

Antitrichia curtipendula (Hedw.) Brid. - bark. 90-106. The species is abundant on bark of *Chamaecyparis nootkatensis.*

Aulacomnium palustre (Hedw.) Schwaegr. - soil. 90-110.

Bryum pseudotriquetrum (Hedw.) Gaertn., Meyer & Scherb. -soil. 91-259.

Campylopus atrovirens De Not. - rock. 90-127.

C. fragilis (Brid.) B.S.G. soil. 91-613.

Ceratodon purpureus (Hedw.) Brid. - soil. 91-361.

Dicranum brevifolium (Lindb.) Lindb. - soil. 90-114.

D. fuscescens Sm. - soil. 90-117.

D. majus Sm. - soil. 91-418.

D. scoparium Hedw. - soil 90-109.

D. undulatum Brid. - soil 90-109.

Heterocladium macounii Best. - soil. 91-290.

Hylocomium splendens (Hedw.) B.S.G. - soil. 90-112. The species occurs in the meadow as indicator of acid, exposed area.

Hypnum circinale Hook. - Bark. 91-307. Known in Canada only from British Columbia.

H. cupressiforme Hedw. - soil. 90-12

Isothecium myosuroides Brid. - bark. 90-104.

Kindbergia oregana (Sull.) Ochyra - decayed wood. 90-103.

K. praelonga (Hedw.) Ochyra - decayed wood. 90-102.

Plagiothecium undulatum (Hedw.) B.S.G. - soil and bark. 90-115.

Pleurozium schreberi (Brid.) Mitt. - soil. 90-110.

Pohlia nutans (Hedw.) Lindb. - soil. 91-602.

Polytrichum formosum Hedw. - soil. 90-111.

Rhacomitrium lanuginosum (Hedw.) Brid. - soil. 90-120.

R. lawtonae Irel. - soil. 91-264b. Known in Canada only from British Columbia.

Rhizomnium glabrescens (Kindb.) Kop. - soil. 90-123.

Rhytidiadelphus loreus (Hedw.) Warnst. soil. 90-121.

R. subpinnatus (Lindb.) Kop. soil. 90-105.

Sphagnum girgensohnii Russ. soil. 90-128.

S. subnitens Russ. & Warnst. ex Warnst.

Ulota phyllantha Brid. - bark. 90-126.

Hepaticae

Barbilophozia hatcheri (Evans) Loeske - rocks. 90-77. The species occurs here in an extremely xeromorphic form, as indicated by the presence of only a few, short cilia at the postical leaf bases when compared with well developed cilia of a normal plant.

Bazzania denudata (Torrey ex Gott. et al.) Trev. - decayed wood. 91-267

Blepharostoma trichophyllum (L.) Dum. subsp. *trichophyllum* - decayed wood. 90-83.

Calypogeia azurea Stotler & Crotz - decayed wood. 90-85.

C. sphagnicola (H. Arnell & J. Perss.) Warnst. et Loeske - with *Sphagnum*. 91-600.

C. suecica (H. Arn. & J Perss.) K. Mull. - decayed wood. 90-99.

Cephalozia bicuspidata (L.) Dum. - decayed wood. 90-85.

C. lunulifolia (Dum.) Dum. - decayed wood. 90-91.

C. macounii (Aust.) Aust. - decayed wood. 90-83.

Cephaloziella divaricata (Sm.) Schiffn. - moist ledges and rock outcrops. 90-8. There are abundant gemmae on the tips of branches.

Diplophyllum albicans (L.) Dum. - bark and soil. 91-321.

D. plicatum Lindb. - soil. 91-387.

Frullania franciscana Howe - bark. 90-85.

F. nisquallensis Sull. - bark and decayed wood. 90-76. Many specimens show abundant oceli arranged in an oblique line on the upper leaves; these specimens are almost indistinguishable from *F. franciscana*. The acute dorsal lobes of these plants distinguish the specimens.

Geocalyx graveolens (Schrad.) Nees - decayed wood. 91-357.

Lepidozia reptans (L.) Dum. - decayed wood. 90-85.

Lophocolea bidentata (L.) Dum. - decayed wood. 91-311.

Lophozia guttulata (Lindb. & H. Arn.) Evans - decayed wood. 91-609.

L. incisa (Schrad.) Dum. - decayed wood. 91-336.

L. ventricosa (Dicks.) Dum. decayed wood. 90-83.

Metzgeria conjugata Lindb. bark. 91-323.

Mylia taylori (Hook.) S. Gray - soil. 91-326.

Odontoschisma denudatum (Nees ex Mart.) Dum. - decayed wood and soil. 91-258. The reddish gemmae are abundant on the tip of shoots.

Plagiochila asplenioides (L.) Dum. - moist soil. Persson s.n. (S).

P. porelloides (Torrey ex Nees) Lindenb.- decayed wood and soil. 91-286

P. satoi Hatt. - bark. Persson s.n. (F).

Porella navicularis (Lehm. & Lindenb.) Lindb. - bark. 90-78.

Radula bolanderi Gott. - bark. 90-78.

Riccardia latifrons Lindb. - decayed wood. 91-360.

Scapania bolanderi Aust. - decayed wood. 90-85.

S. umbrosa (Schrad.) Dum. - decayed wood. 90-83.

The bryophyte flora of Thermal Meadow, Hotsprings Island contains 15 families, 20 genera and 31 species of Musci and 16 families, 20 genera, 28 species and a subspecies of Hepaticae. All of these taxa are reported from Hotsprings Island for the first time.

There are unusually abundant occurrence of subtropical elements of Hepaticae, especially the species of *Frullania* and *Radula*, possibly due to geothermal activity near the surface of thermal meadow. The above facts are caused not only by the geothermal activity but also by the surrounding undisturbed protective forests which maintain constant stable microclimate that parallels the condition of the thermal meadow.

Among the 31 species of Musci the following two rare species were collected in the meadow.

1) *Heterocladium macounii*: In Canada the species is found only in British Columbia and known in Alaska, Idaho, Oregon and Washington. It has also been reported in North Carolina.
2) *Rhacomitrium lawtonae* Irel.: in Canada is found only in British Columbia but is reported in Attu Island, Alaska, Washington and Japan.

There are a total of 42 endemic taxa and 23 North Pacific Arc taxa in western North American Hepaticae (Hong, 1987). Among 29 taxa of hepaticae of Thermal Meadow, the following 4 endemic taxa and 3 North Pacific Arc taxa are recognized.

A. Western Nortn American taxa:

1) *Frullania franciscana* Howe. The species occurs in Alaska, British Columbia, California, Oregoa and Wasnington.
2) *F. nisquallensis* Sull. The species occurs in Alaska, British Columbia, California, Oregon and Washington.
3) *Porella navicularis* (Lehm. & Lindenb.) Lindb. The species occurs in Alaska, British Columbia, California, Idaho, Montana, Oregon, Washington and Wyoming.
4) *Radula bolanderi* Gott. The species does not extend southward of San Francisco Bay. The species occurs in Alaska, British Columbia, California, Oregon and Washington.

B. North Pacific Arc taxa:

1) *Diplophyllum plicatum* Lindb. The species occurs in Japan, Korea, Sakhalin, Siberia, Alaska, British Columbia, Oregon and Washington.
2) *Plagiochila satoi* Aust. The species occurs in Japan, Korea, Alaska, British Columbia, Oregon and Washington.
3) *Scapania bolanderi* Aust. - The species occurs in Japan, Alaska, British Columbia, California, Idaho, Oregon and Washington.

The presence of 4 western North American endemic and 3 North Pacific Arc taxa represents 24.1% of entire hepatic flora of the Thermal Meadow (total 29 taxa).

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Literature Cited

Calder, J.A. & R.L. Taylor. 1968. Flora of the Queen Charlotte Islands. Part 1. *Canada Dept. of Agriculture Monograph* No. 4. Ottawa. 659. pp.

Grolle, R. 1983a. Hepaticae of Europe including the Azores: an annotated list of species. *Journal of Bryology* 12: 403-459.

_________. 1983b. Nomina Generica Hepaticarum: references, types and synonymies. *Acta Botanica Fennica* 121: 1-62.

Hong, W. S. 1987. The distribution of western North American Hepaticae. Endemic taxa and taxa with a North Pacific Arc distribution. *The Bryologist* 90: 344-361.

Ireland, R. R., Brassard, G. B., Schofield, W. B. & Vitt, D. H. 1987. Ciecklist of the mosses of Canada II. *Lindbergia* 13: 1-12.

Stotler, R. & B. Crandall-Stotler. 1977. A checklist of the liverworts and hornworts of North America. *The Bryologist* 80: 405-428.

Vitt, D. H. 1982. Sphagnopsida and Bryopsida. pp. 305, 307-336. In: S. P. Parker (ed.) *Synopsis and Classification of Living Organisms*. McGraw-Hil. New York.

The *Sphagna* of Peebles Island

William R. Town, Marilou Pudiak and Michael Corey[1]

Peebles Island is located at the junction of the Mohawk and Hudson Rivers in the extreme southeast portion of Saratoga County, New York, U.S.A. (42"47'N, 73"41'W). Peebles Island (presently an undeveloped State Park) is approximately 132 acres in area, has an average elevation of about 50 feet, consists of rolling hills, mostly deciduous woods, brush and old fields along with several seasonally wet depressions. The Island is made of Utica, Canajoharie and Normanskill shales deposited during the Upper-Middle Ordovician period of the Paleozoic Era (about 450 million years ago) and is covered by glacial debris and alluvial deposits. Numerous man-made trails traverse the Island and one seepage area is prominent. A list of botanical species present on the Island was prepared by Mr. Stanley J. Smith (Curator of Botany of the New York State Museum 1947 - 1978) prior to 1977 but no reference was made to *Sphagna* (although 12 species of bryophytes in 9 other genera were recorded). Because of the rapid elimination of rains and melting snows through run-off and percolation, the Sphagna present on the Island grow very slowly and tightly appressed to the ground rather than in their typical growth form found in bogs and fens. During our Sphagnum survey of the Island in 1989, 1990 and 1991, we recorded five species of *Sphagnum*. All samples of *Sphagnum* collected (34) at the four different *Sphagnum*-containing sites were confirmed as to correctness of species identification by Dr. Richard E. Andrus (S.U.N.Y.) and voucher specimens are contained in both The Paludiological Society, Inc. herbarium located at Shenendehowa Central High School in Clifton Park, New York, 12065-3688 and the herbarium at S.U.N.Y. at Binghamton.

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Access to Peebles Island is possible only through Cohoes. From Cohoes take Ontario Street (Rt. 470) accross Simmons Island onto Van Schaick Island. Just before the bridge to Troy, turn left onto Delaware Avenue (Peebles Island access road). From Troy, cross the Hudson River via the 112th. Street bridge and turn right just after the bridge onto Delaware Avenue (Peebles Island access road).

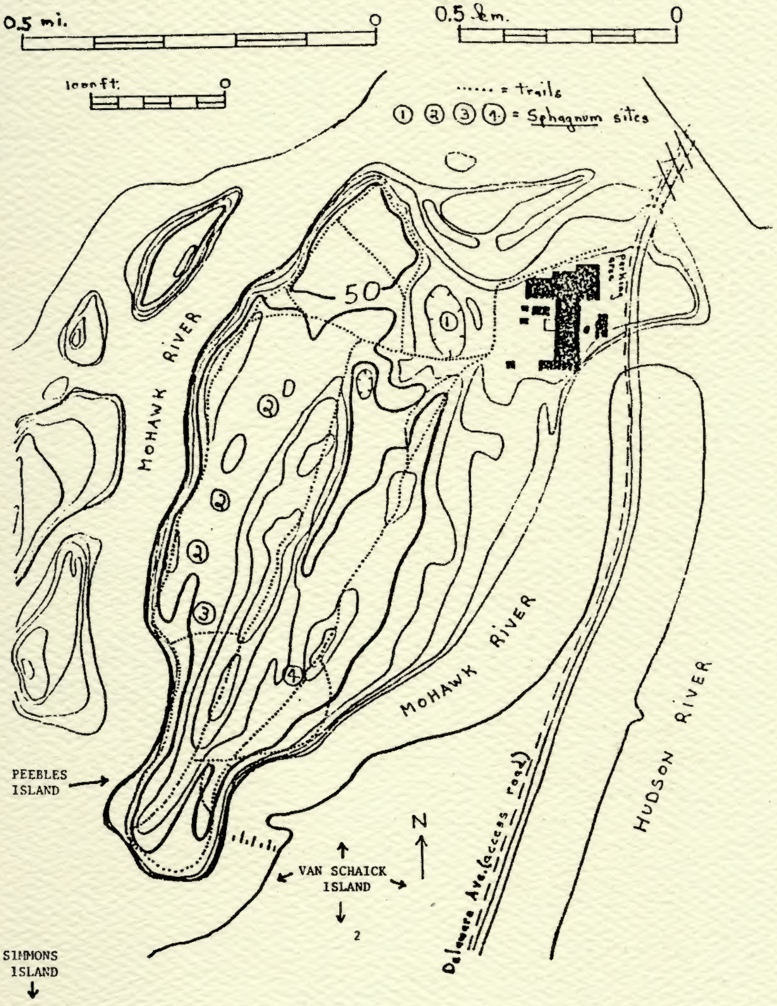
Site 1: A small, wet depression dominated by buttonbush (*Cephalanthus occidentalis*)- The water level fluctuates from flooded during times of heavy rains or snow melt to dry in times of no rain or snow melt; percolation of accumulated waters is much slower here than at the other three sites. *Sphagnum lescurii* Sull. is found here at the periphery of the depression in small, scattered patches.

Site 2: A long, narrow channel with drainage to both the Southwest and Northwest. The area is dominated by maples (*Acer* spp.) and oaks (*Quercus* spp.) *Sphagnum affine* Ren. & Card., *S. fimbriatum* Wils., *S. lescurii* Sull. and *S. subtile* (Russow) Warnst. are found scattered throughout this region.

Site 3: A seepage area with obvious silky dogwood (*Cornus amomum*) and species of prickly brambles (*Rubus* spp.). Golden-brown *Sphagnum lescurii* Sull. is the only species of *Sphagnum* present at this site.

Site 4: A wet depression with maples (*Acer* spp.), oaks (*Quercus* spp.), and a few scattered conifers. *Sphagnum lescurii* Sull., *S. fimbriatum* Wils. and *S. russowii* Warnst. are found in small, scattered patches throughout this area.

The authors thank Dr. Richard E. Andrus, S.U.N.Y. at Binghamton for confirming *Sphagnum* species identifications. *Sphagnum* nomenclature is after Andrus, R. E. 1980. Sphagnaceae (Peat Moss Family) of New York State. *Contributions to the Flora of New York State III*. Richard S. Mitchell (ed.). Bull. No. 442, New York State Museum, Albany, NY 12230.



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